DOCUMENT RESUME

ED 145 166 95 CE 012 822

AUTHOR Morrisohn, John P.
TITLE Instructional Programming: Development and Validation of Instructional Modules for Graphic Production Programs. A Research and Development Report.
INSTITUTION Santa Barbara City Coll., Calif.
SPONS AGENCY Bureau of Occupational and Adult Education (DHEW/OE), Washington, D.C.
BUREAU NO VEA-42-69294-C-7-900
PUB DATE 77
NOTE 123p.; Best copy available

EDRS PRICE MF-$0.83 HC-$6.01 Plus Postage.
DESCRIPTORS Commercial Art; Community Colleges; Curriculum Design; Curriculum Evaluation; *Graphic Arts; *Individualized Curriculum; *Instructional Materials; Junior Colleges; Layout (Publications); *Learning Modules; *Material Development; Photography; Program Effectiveness; Program Evaluation

ABSTRACT

The purpose of the study was to develop and validate individualized instructional modules for graphic production at the community college level. Seven components of the research and development process were product selection, literature review, planning, development of the preliminary form of the product, preliminary field test and product revision, main field test and product revision, and operational field test and product revision. Three modules were developed covering the areas of design, paste up, and process camera. Each contained a flow chart of the module structure, a rationale, performance objectives, learning activities, a posttest, and a summation. The modules were field tested and revised by administering a pretest to the students and calculating the percentage of students attaining a score of 80% or better on a posttest for each unit. The effectiveness of the design was significant since well over 90% of the students scored 80% or higher on the posttest, and over 80% of the participants in the operational field test evaluated the modules as being very appropriate. (Module flow charts, a module evaluation form, and the three instructional modules are appended to this report.) (BL)

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ED145166

Instructional Programming: Development and Validation of Instructional Modules for Graphic Production Programs

by

John P. Morrisohn

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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A Research and
Development Report
for
Occupational and Career Education

Part C - V.E.A. Project
#42-69294-C-7-900

Santa Barbara City College
Santa Barbara, California

1977

CE 012 822

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INTRODUCTION

Customarily one regards programmed learning (self-instruction material) as one kind of learning opportunity or activity, a sub-category within the class of learning contacts. Textbooks, films, field trips, and the like are other types of contacts used in the instructional process. But, programmed learning is more than an instructional tool; it is an instrument for educational research. As such, programming can be appraised in terms of its contribution to research rather than treated as a direct aid in instruction.

Programmed materials and techniques are stimulating activity in certain aspects of curriculum inquiry. The situation is analogous to the use of the tachistocope in reading. This instrument generated concern for discrimination and speed in word recognition as opposed to inquiry in, say, skills of critical reading. Also, many in an earlier generation found the appearance of tests of intelligence cause for involvement in mental measurement, while a short time later the invention of the sociogram focused inquiry on the interaction of personality and the social system of the classroom. So, today, programmed learning is influencing research in the curriculum.

Programming appears to be "correcting" an overemphasis and narrow focus associated with prior popular research tools. Instead of measuring the numerous ways in which individuals and classrooms differ, the new technique requires that instruction be modified in the light of these differences. Thus programming promises to fill one of the greatest gaps in curriculum--the imbalance between ways to categorize individuals and the scarcity of ideas for identifying and manipulating instructional variables according to individual differences and the subject matter being taught.

The programming of instruction is a process of designing instructional materials and systems which results, if followed to its full extent, in a rationally constructed and empirically validated product, or set of procedures (Popham 1967). The market for programmed instruction is not yet large. The National Education Association estimated that 21.8 percent of the secondary schools and 16.5 percent of the elementary schools were using programmed instruction; in addition, few of these schools employed it intensively (National Education Association...1967). No estimate exists of the comparative use of fully researched materials in a market flooded with unresearched or partially researched programs.

The impact of validated programmed material on the educational system has been quantitatively and qualitatively

minimal as pointed out by Kapfer and Kapfer (1972):

> A confusing array of alternative approaches to packaged learning exists on the educational scene. Many claim to be effective means for individualizing instruction for students. Others do not mention individualization, but in fact are individualized. And still other packages are specifically designed for teacher-conducted group instruction and yet contain some elements similar to those included in packages designed for individualization. Viewed in perhaps the simplest way, individualized instruction and/or learning packages are systematized ways of delivering content and process to learners. (p.9)

Johnson and Johnson (1973) in introducing their book on instructional package development, suggest that instructional packages allow teachers the time and opportunity to, among other things, inspire and motivate, and identify and encourage creativity and self-direction. It appears then, that instructional "package" is a loosely defined term limited only by the condition that it must systematically deliver content and process to learners.

An issue of Educational Technology (September, 1972) was devoted to the discussion of learning packages. One consistent point made by the authors in that journal is that packages are developed to facilitate the attainment of the objectives of the package by specified populations. The instructional approach of packages may be conceptualized as linear programming (Skinner, 1968) or as sequencing as described by Bruner (1966). Both of these approaches consist of stating terminal skills or objectives and then

sequencing or programming a series of subskills to facilitate attainment of the terminal objectives or skills (Baum and Chastain, 1972). While the instructional approach and the systematic delivery of content and process to learners provide two consistencies among packages, the size and scope of packages differ considerably.

In the broad sense, programmed instruction is a process in which behavioral objectives are developed and validated (Hofmeister, 1971). The potential of developing programmed materials for improving instructional effectiveness depends upon the expansion of developmental research. Borg and Gall (1971) note that Research and Development "appears to be the most promising strategy we now have for improving education." (p.413). Education research and development refers to systematic process for developing and validating an educational product. Therefore, Research and Development can be viewed as a process of reducing uncertainty regarding the nature of new products and the efforts required to achieve prespecified outcomes (Baker and Schutz, 1972). A product, used in this sense, is not limited to material, manuals, or films, but also to methods of instruction or procedures of administration that are replicable. In comparing the respective contributions of other types of research to Research and Development, Borg and Gall state:

> "Although they have many important contributions to make to education, basic and applied research are generally poor methodologies for developing new products that can be used in the schools. In applied research particularly, the researcher often finds himself comparing poorly designed, unproven, or incomplete products to determine which is less inadequate. This methodology generally produces negative or inconclusive results, and at best brings about improvement in education at a slow rate....
>
> Educators and researchers have been seeking a way to bridge the gap between research and practice for many years. This is precisely the contribution of educational R & D. It takes the findings generated by basic and applied research and uses them to build tested products that are ready for operational use in the schools." (p.414)

Statement of the Problem

A careful review of literature concerning the development of programmed materials indicates an absence of validated materials in the area of graphic production. The problem is that little evidence or information is available to indicate that thoroughly researched and validated instructional modules are available in the area of graphic production that could be utilized by community college instructors in occupational and career education classes.

Purpose of the Study

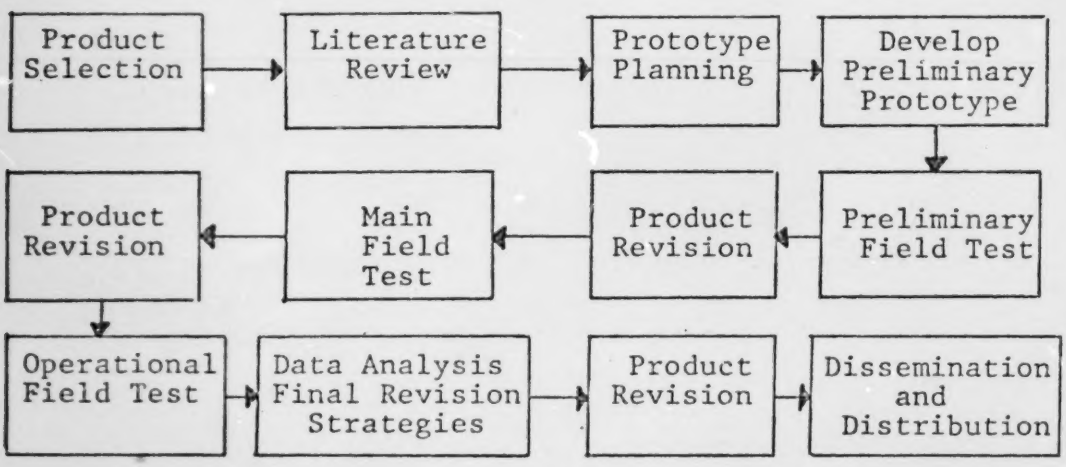
The purpose of this study is to develop individualized instructional modules for graphic production at the community college level. The more specific area of concern in this study is the validation of the instructional modules. The purpose of the review of literature in this Research and Development study is to: 1) determine the state of knowledge

in the area of concern, and 2) determine how that knowledge can be applied to the educational product being considered (Borg & Gall, 1971). Especially relevant to the study, based on the review of literature, are texts, studies, and other sources that could be used to support the development of these instructional packages. Thus, the purpose of the study was to develop and assess the effectiveness of these instructional modules following the Research and Development procedure.

Procedures

This study utilized the general approach of the research and development (R & D) process as outlined by Borg and Gall (1971)

The seven components of the Research and Development process incude 1) product selection, 2) literature review, 3) planning, 4) development of the preliminary form of the product, 5) preliminary field test and product revision, 6) main field test and product revision, 7) operational field test and product revision.



Product Selection - The product selection for this project consists of learning materials in the form of individualized instructional modular units to be used in the graphic production programs at the post-secondary level.

Literature Review - The Literature Review component of the R & D process resulted in an adequate analysis of the need, and a potentially feasible solution. Support for the development of curriculum materials relevant to the needs of the graphics industry across the nation is indicated by the Graphic Arts Industry Manpower Study sponsored by Eastman Kodak (Kodak, 1973).

Prototype Planning - The planning component is perhaps the most important aspect of research-based educational products. The statement of specific objectives to be achieved by the product was accomplished during this procedure. Each instructional unit contains specific behavioral outcomes related to the cognitive and psychomotor processes which can be measured on the post-test.

The distinction between a standardized test score distribution and a score on a criterion test is critical in the development of effective instructional products. Norm-referenced tests have proved useful in student counseling but have not been as useful for student evaluation (Stake, 1967). The programmer needs to know how much of what he set out to teach has been learned by each student rather than where any particular student stands relative

to others who have been exposed to the same instruction (Tyler, 1966). Glaser identifies the appropriate criterion measures for objectives as follows:

> Behaviorally defined objectives describe the specific tasks a student must be capable of performing in order to achieve a particular knowledge of competence level....Measures cast in terms of such criterion standards provide information as to the degree of competence obtained by a particular student which is independent of reference to the performance of others. (Glaser 1965, p. 801)

Develop Preliminary Prototype - The Preliminary Prototype component of the R & D process included preparation of instructional format and model lessons, projects, information and procedure sheets, and evaluation devices. These individualized instructional modules united three levels of learning: motor chains, principle usage, and problem solving - with instructional techniques and evaluations. (Briggs 1970).

Preliminary Field Test and Product Revision - "The purpose of the preliminary field test is to obtain an initial qualitative evaluation of the new educational product." The modules were revised on the basis of the data collected from the preliminary field test. The preliminary field test was conducted by the instructional package developer and administered to a panel of experts to evaluate the technical, organizational, and evaluation procedures of each instructional module. The module evaluation form in appendix B was used.

The most difficult problem encountered in this phase was trying to use the materials as I expected the students to use them. In my first module--design--it took several days for me to condense the material to fit the approximated minimum time required to complete the module. Then, I used the materials as I would expect the students to do, and much to my surprise, the module took twice as long to complete as I had estimated.

After the design module was revised, it was reviewed by a panel of three professors. Minor corrections were made in the programmed material and the design module was reproduced for field testing with students enrolled in the graphic arts technology class.

The students enrolled in graphic arts technology accepted the module approach but seemed to have difficulty visualizing how the evaluation and type of learning activities were connected. The hierarchy of enabling objectives only helped them to see the path to accomplishing the performance objectives.

After the first module, I felt a need to develop a simple model that I could apply to all the course modules which would tie together the types of learning and evaluation at the various stages of development. This, I decided, would help me and the students to visualize the learning complexities of each module as they relate to the aforementioned elements (appendix A).

Observable Results:

1. When the students were first exposed to the design module without the model, they seemed to accept the package, but I observed that they were a little confused and reluctant to pursue the module.
2. When the students were exposed to a visual of the module model, they readily accepted the module.

Recommendations to improve materials:

1. Revise the experimental project in the design module to include one comprehensive instead of two, one rough instead of two, and four thumbnail sketches instead of two. Also, printed examples of the letterheads are needed in the module.
2. Addition of a dummy layout for the memo pad project in the paste-up module.
3. During complex experimental projects, there is a need for the instructor, or assistant, to evaluate each student during the project performance.

Main Field Test and Product Revision - The Main Field Test determined that the instructional modules meet specific behavioral objectives. It was conducted by the package developer on a small group of 20 community college students. The main field test procedure included the collection of quantitative data on the students' post-performances on the design, paste-ups, and process camera modules. The results are compared with course objectives, and minor corrections were made of each segment that was in need

of revision. In the evaluations, the students suggested that cartoons be used in the modules to make them more interesting.

All the students who pursued the modules achieved the acceptable 80 percent level. The students, by following the learning levels in the model, performed the tasks faster, and retained more information through this systematic approach than by the conventional method. This was extremely obvious in the process camera module.

Operational Field Test and Product Revision - The purpose of the operational field test is to determine if the revised instructional modules could be used in graphic production classes by faculty at the post-secondary level. The operational field test would be a satisfactory test of how well the instructional modules would function under practical conditions. Three items were investigated to determine the effectiveness of the instructional modules. The three items are: (1) How effective are the units in achieving the behavioral objectives? The acceptable criteria for this item was that 80% of the participants will score 80% on the post-test of each modular unit; (2) How do the participants react toward the use of the modular units? The acceptable criteria for this item is that 80% of the participants will rate all aspects acceptable on the rating form; (3) How effective are the modular units at the post-secondary levels? This will be assessed by participants pretest-posttest performances. Revision of the modular

units will be conducted as suggested by the operational field test results.

Statistical Procedures

The effectiveness of the instructional modules was determined by calculating the percentage of students attaining a score of 80% or better on the posttest for each unit. To establish preinstructional need and as a comparison to the posttest results, the Pearson Correlation Coefficient procedure was applied to pretest and posttest scores of each unit for the total sample and the means and standard deviation of the means of each test were determined. Then a T-test was implemented to determine if the significant difference between the posttest and pretest was significant beyond the .0005 level for each group of students on all three modules.

The main field test was first applied to a group of 29 graphic production students at Santa Barbara City College. The students took the pretest and were given the full treatment both cognitive and psychomotor, of the design, paste-up, and processes camera instructional modules. All the students who participated attained the 80% criterion of all the unit posttests.

Table I

Percentage of participants attaining 80% criterion on the unit posttest for the Design, Paste-up, and Process Camera Modules for the Graphic Production class at Santa Barbara City College.

College Class	Modules		
	Design	Paste-up	Process Camera
Graphic Production	93%	100%	100%

The difference between the pretest (dependent variable) mean and the posttest (independent variable) mean on the three units for the graphic production participants was statistically compared for significance using the T-test for correlated means.

Table II

The Pretest Mean, Posttest Mean and Mean Gain for the Graphic Production participants at Santa Barbara City College for the Design, Paste-up, and Process Camera Modules.

Unit	# of Items	Pretest Mean	Posttest Mean	Mean Gain
Design	15	9.55	13.59	4.04
Paste-up	10	5.31	9.62	4.31
Process Camera	20	7.17	18.69	11.52

Table III

The Standard Deviation of the Pretest Mean, Standard Deviation of the Posttest Mean, T-test scores of the graphic production participants at Santa Barbara City College for the Design, Paste-up, and Process Camera Modules.

Unit	S.D. of Mean Pretest	S.D. of Mean Posttest	T
Design	1.84	1.35	9.51
Paste-up	5.31	9.62	17.54
Process Camera	3.13	1.20	18.52

After the graphic production group was tested, I decided to try the modules on the advertising class at Santa Barbara City College. A pretest was given to the 27 advertising class participants. Only the cognitive treatment of the modules was applied to the group covering the design, paste-up and process camera modules. Then a posttest was given to the participants.

Table IV

The Pretest Mean, Posttest Mean, and Mean Gain for the Advertising Class participants at Santa Barbara City College for the Design, Paste-up, and Process Camera Modules.

Unit	Number of Items	Pretest Mean	Posttest Mean	Mean Gain
Design	15	6.70	11.82	5.12
Paste-up	10	4.41	8.00	3.59
Process Camera	20	5.48	16.04	10.56

Table V

The Standard Deviation of the Pretest Mean, Standard Deviation of the Posttest Mean, T-Test scores of the Advertising class participants at Santa Barbara City College for the Design, Paste-up, and Process Camera Modules.

Unit	S.D. of Mean Pretest	S.D. of Mean Posttest	T
Design	1.84	1.35	9.51
Paste-up	5.31	9.62	17.54
Process Camera	3.13	1.20	18.52

Conclusions

The effectiveness of the design, paste-up, and process camera modules was significant well beyond the .0005 level on a one-tail test according to the T-test results. Since well over 90% of the graphic production scored 80% or higher on the posttest, it was also significant in indicating the strength of the instructional modules.

Also, over 80% of the participants in the operational field test, using the module evaluation form, evaluated the modules as being very appropriate. All participants had mean gain from the pretest to the posttest on all modules. Therefore, the results of the study indicate that all the modules tested were very effective according to the test results, client evaluations, and the T-test results were extremely significant beyond the .0005 level.

Delimitations of the Study

This study was limited to post-secondary levels of occupational and career education, and generalization will be limited to this population. Therefore, the study is limited by the participants' interpretations of the modules and to the accuracy of their evaluations of the instruments.

Another limitation is the number of graphic production occupational modules chosen for this study. The number of occupational modules possible to include in this study precludes generalization to all occupational modules in the graphic communications area except at great risk.

JM/sw

REFERENCES

Baker, R. & Schutz, R. Instructional Product Development. New York: Van Nostrand Rhineholdt Publishing Co., 1971.

Baum, D. & Chastain, T. "Training Packages." Educational Technology, 1972, 12(9), 46.

Borg, W. & Gall, M. Educational Research: An Introduction. New York: McKay, 1971.

Briggs, L. Handbook of Procedures for the Design of Instruction. Washington, D.C.: American Institutes for Research, 1970.

Bruner, J. Toward a Theory of Instruction. New York: W.W. Norton and Co., 1966.

Eastman Kodak Company. Kodak Graphic Arts Industry Manpower Study. Kodak publication #Ed10-17T, Rochester, New York: 1973.

Ferguson, G. Satistical Analysis in Psychology and Education. San Francisco: McGraw-Hill, 1971.

Glaser, Robert. Teaching Machines and Programmed Learning II: Date and Directions. NEA, 1965.

Hofmeister, A. "Programmed Instruction Revisited." Training Paper #2, Exceptional Child Center, Utah State University: 1972.

Johnson, R. & Johnson, S. Assuring Learning with Self-instructional Packages, or ... Up the up stair case. Philippines: Self Instructional Packages Inc., 1973.

Kapfer, P. & Kapfer, M. "Introduction to Learning Packages." Educational Technology, 1972, 12(7), 53-54.

Mager, R. Measuring Instructional Intent, or Got a Match? Belmont, Calif: Fearon Publishers, 1973.

National Education Association. "Public School Programs and Practices." NEA Research Bulletin, 1967, 45(4), 103-126.

Popham, W. "Product Development Cycle in the Southwest Regional Laboratory for Educational R&D." NSPI Journal, 6(9), 4-8.

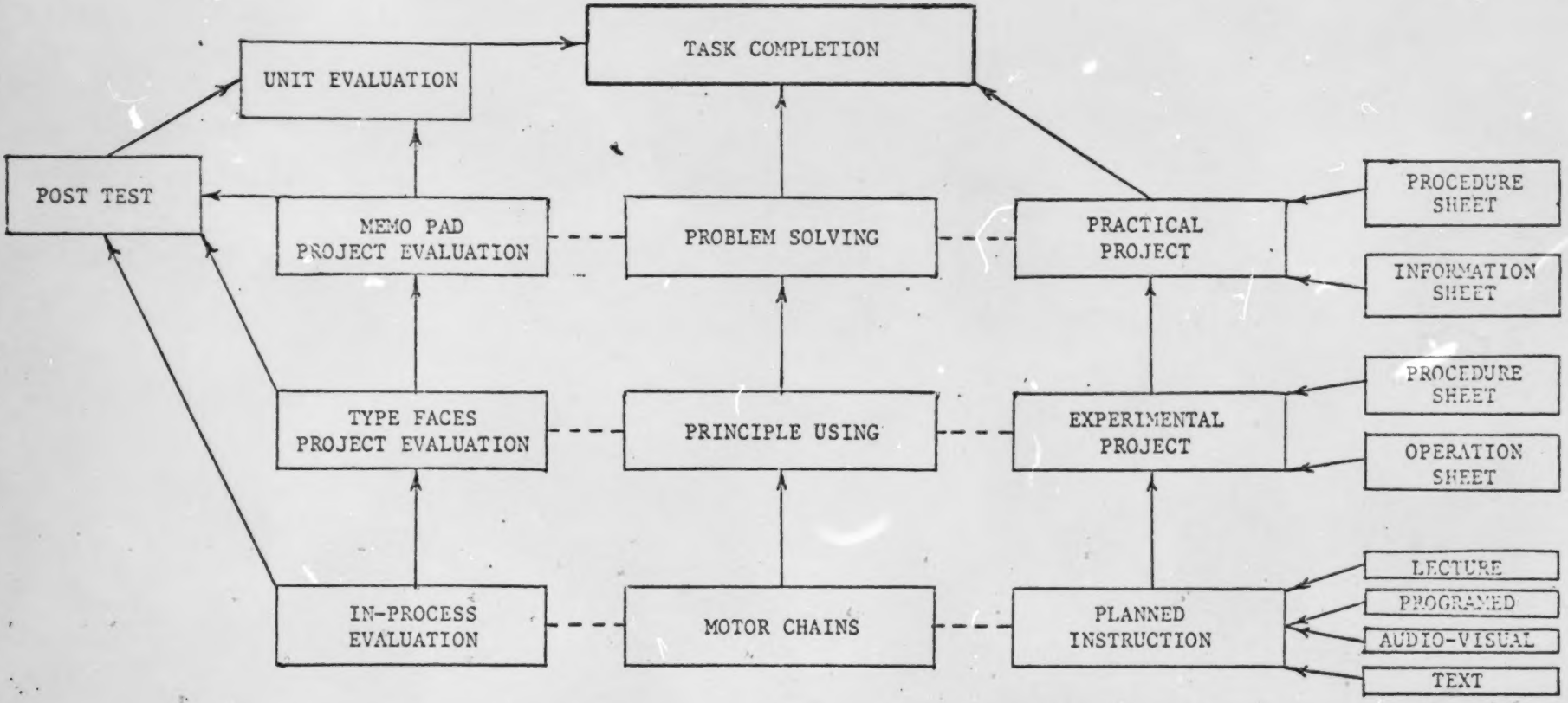
Skinner, B. The Technology of Teaching. New York: Appleton-Century-Crofts, 1968.

Stake, Robert. "Toward a Technology for the Evaluation of Educational Programs." Perspectives of Curriculum Evaluation. American Research Association Monograph Series, No. 1. Chicago: Rand McNally, 1967, 1-12.

Tyler, R. "New Dimensions in Curriculum Development." Phi Delta Kappan, Sept., 1966.

APPENDIX A

FLOW STRUCTURE OF MODULES



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EVALUATION

TYPES OF LEARNING

TYPES OF INSTRUCTIONAL ACTIVITIES

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John P. Morrisohn

APPENDIX B

PRELIMINARY FIELD TEST

MODULE EVALUATION FORM

After completing the module, please rate the following parts of the module from Low to High. Specify what changes should be made in the space provided.

1. I rate the appropriateness of the rationale as:
   LOW 1 2 3 4 5 HIGH
   What should be changed? _____

2. I rate the relevance of the performace objectives as:
   LOW 1 2 3 4 5 HIGH
   What should be changed? _____

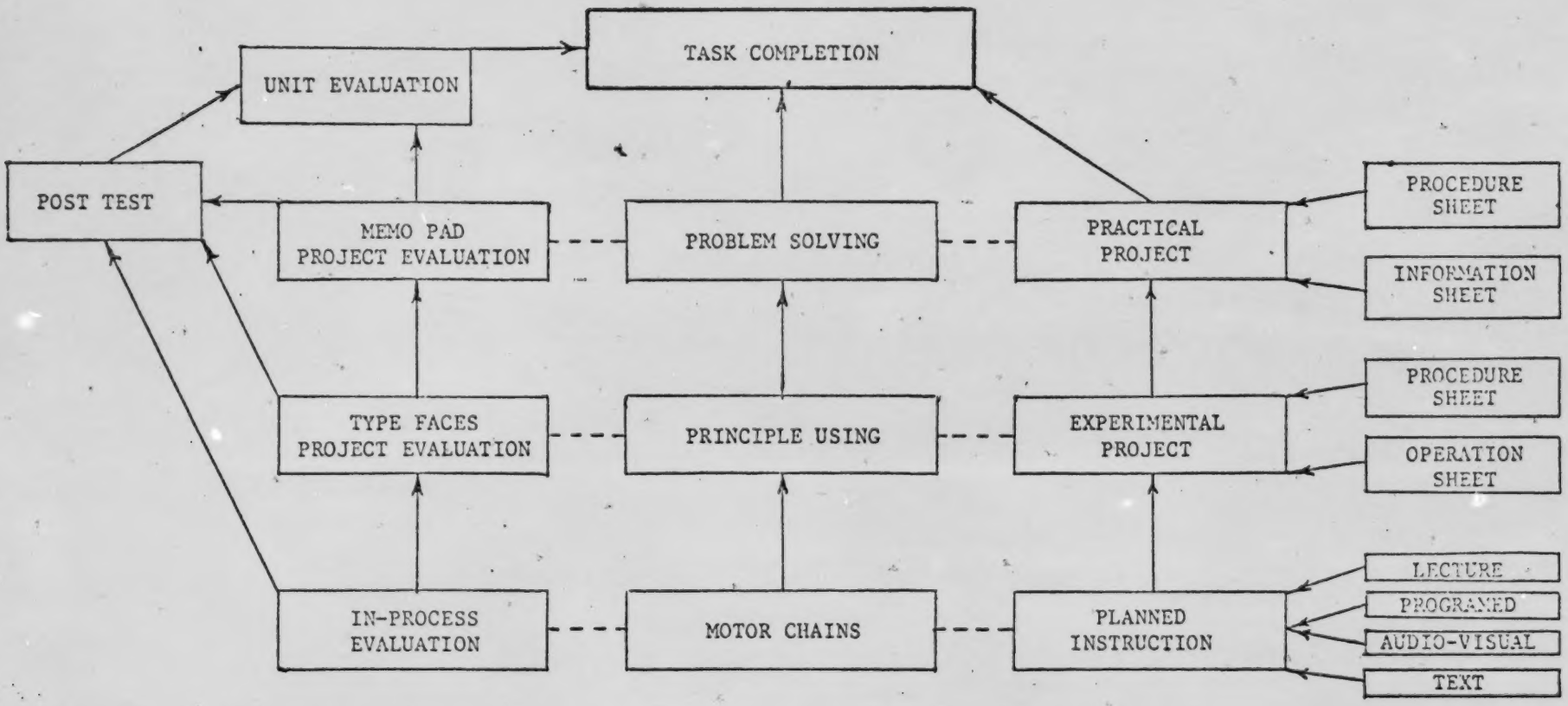
3. I rate the usefulness of the learning activities as:
   LOW 1 2 3 4 5 HIGH
   What should be changed? _____

4. I rate the effectiveness of the operation sheets as:
   LOW 1 2 3 4 5 HIGH
   What should be changed? _____

5. I rate the evaluation procedures as:
   LOW 1 2 3 4 5 HIGH
   What should be changed? _____

APPENDIX C

FLOW STRUCTURE OF MODULES



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EVALUATION

TYPES OF LEARNING

TYPES OF INSTRUCTIONAL ACTIVITIES

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APPENDIX D

Individualized

Instructional Modules

By

John F. Morrisohn

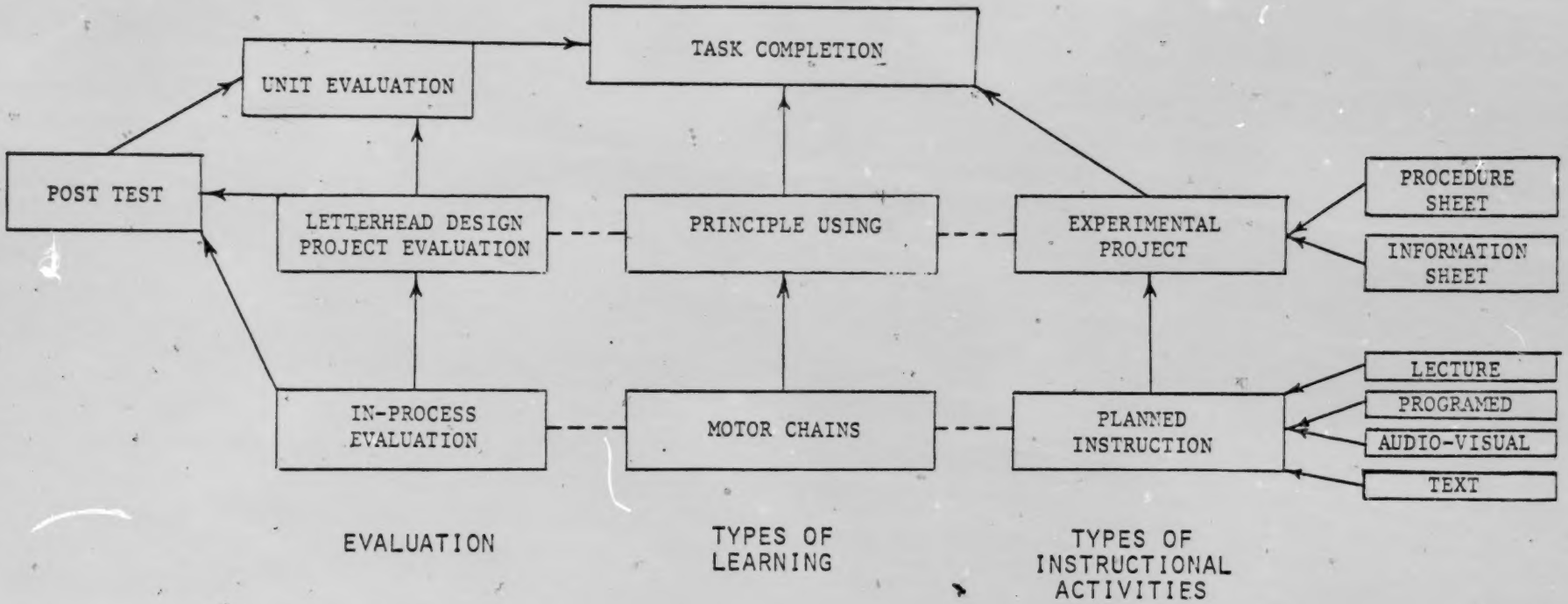
Graphic Production 1

DESIGN

Graphic Communications Department

Santa Barbara City College

DESIGN MODULE



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DESIGN

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Learning Activity

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Scramble Book: Typography and Design	G-13:IS-2
Information Sheet: The Business Letterhead	G-13:IS-3
Procedure Sheet: Designing a Letterhead	G-13:IS-4
Project Evaluation	G-13:E-1
In-Process Evaluation	G-13:E-2
Post Test	

Summation

RATIONALE

Graphic design is the planning, or blueprint stage essential to molding ideas into fine pieces of printing. This is accomplished through the juxtaposition of elements - type, photographs, drawings or illustrations, rules, tint screens and grouping materials to utilize white space in an effective manner which will help to communicate your message. The design should be made functional and treated with the appropriate style to reach the audience for which it was intended. For example, you would not use dainty script type for a trucker's advertisement. Through effective layouts the creative style of the designer will have impact and stimulate the client's interest in the product.

PERFORMANCE OBJECTIVES

Given basic information about a printing project, the student should be able to make thumbnail sketches, roughs and put together simple comprehensive layouts, and should be able to select the proper materials and processes to effectively complete the printing project within 90 percent accuracy based upon Project Evaluation Sheet G-13:E-1.

Students should have as basic understanding of graphic design techniques, balance, proportion, shape harmony, unit arrangement, formal and informal layouts, thumbnail sketches, roughs, comprehensive layouts, type sizes, type faces and type legibility within 90 percent accuracy according to the Post Test Evaluation G-13:E-3.

LEARNING ACTIVITY

Designing a Letterhead

PERFORMANCE OBJECTIVE:

Given the prerequisite instruction on the fundamentals of design, you will produce thumbnail sketches (two for each design), roughs, and two finished comprehensives of business letterheads.

The following activities must be completed:

1. Read Broekhuizen, R. J., Graphic Communications, McKnight Career Publications, 1973, pp 24-42.
   or
   Silver, Modern Graphic Arts Paste-Up, American Technical Society, 1973, pp 15-22.
   or
   Delmar, Printing Layout and Design, Delmar Publishers, 1969, pp 1-55.
   or
   Instructor's presentation of overhead transparencies on layout and design.

2. Review the scramble units, information sheet, and procedure sheet on the business letterhead

3. Complete the in-process evaluation G-13:E-2, request answer key and instructor's approval on planning and evaluation sheet G-13:E-3.

Scramble Book Page 1

SCRAMBLE BOOK

LAYOUT AND DESIGN

1. To obtain a pleasing appearance, each printing job should be the result of a plan or layout. There are three common types of layouts: the thumbnail sketch, the rough layout and the comprehensive. The thumbnail is a small quick drawing. Several of these are usually done to explore different possibilities. The rough layout is made with more care, and is the one most frequently used. It gives an indication of the size, weight, and style of type chosen. The comprehensive layout is used when it is necessary to show what the final job will look like before production begins.

Turn to page 2, item 1

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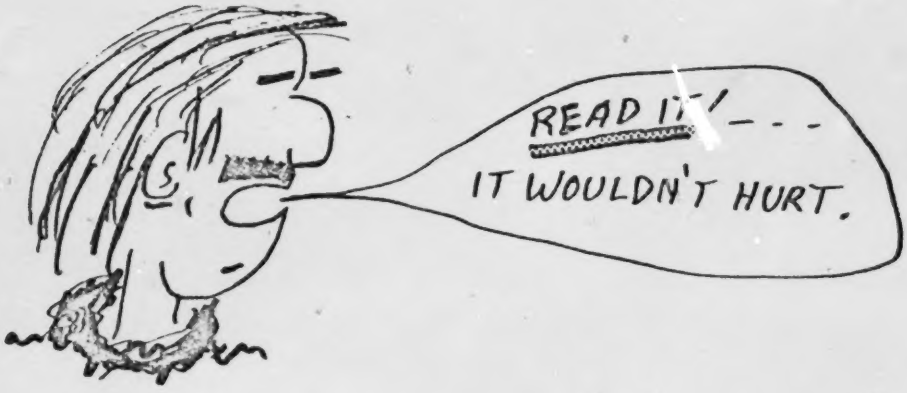
2. You have selected the incorrect answer: re-read page 3, item 1.

---

3. You have chosen the wrong answer: re-read page 4, item 2.



Scramble Book Page 2

1. The thumbnail sketch is a small, quick drawing.

   If the statement is true, turn to page 3, item 1.

   If the statement is false, turn to page 4, item 1.

---

2. Negative space refers to printed areas.

   If the statement is true, turn to page 1, item 2.

   If the statement is false, turn to page 4, item 2.

---

3. Correct. The symmetrical layout is best for jobs with a formal, traditional motif. One of the most difficult things to learn in elementary paste-up work is the proper utilization of available space. It is often difficult to judge the amount of space needed for a given amount of copy. Overestimating and underestimating often occur, thus requiring either deletion or addition of copy or extensive manipulation. An effort should be made to estimate the amount of material which can be fitted into a given area. Materials should be grouped into logical units and adequate space provided around all illustrations and blocks of copy.

   Turn to page 3, item 3.

---

4. Sorry, please re-read page 2, item 3.

Scramble Book Page 3

1. You are correct: the thumbnail sketch is a small, quick drawing. Any printed piece has two complementary design aspects: The printed areas and the non-printed areas. They are both subject to the designer's manipulation. The non-printed areas are often referred to as white space or negative space. It is necessary for the printing designer to be aware of the importance of white space, since it affects the readability, appearance and effectiveness of the design. When planning the paste-up, an effort should be made to judge spatial relationships and make optimum use of white space.

Turn to page 2, item 2.

---

2. The symmetrical layout is best for jobs with a traditional, formal motif.

If the statement is true, turn to page 2, item 3.

If the statement is false, turn to page 1, item 3.

---

3. Deletion or addition of copy is the result of proper estimation of available space.

If the statement is true, turn to page 2, item 4.

If the statement is false, turn to page 4, item 3.

Scramble Book Page 4

1. You have selected an incorrect answer. It is important that you understand the principles of a layout: re-read page 1, item 1.

---

2. You are correct: Negative space refers to non-printed areas, not printed areas. Printing layouts generally fall into two design categories. They are the center and the off-center, sometimes called symmetrical and asymmetrical layouts. The symmetrical layout is best for jobs with a formal, traditional motif and the asymmetrical is best for modern themes.

Turn to page 3, item 2.

---

3. You have selected the correct answer: Deletion or addition of copy is the result of overestimation or underestimation of available space.

THE END

Scramble Book Page 1

SCRAMBLE BOOK

TYPOGRAPHY AND DESIGN

1. Knowledge of the printers' measurement system is important in understanding and working with typographical designs. The printers' measurement is the accepted standard of communicating dimensions in printing. It should be learned as a basic step in any course in graphic arts. The printers' measurement consists of the following:

   6 picas = 1 inch

   12 points = 1 pica

   1 nonpareil = 6 points or 1/2 pica

   1 agate = 5 1/2 points

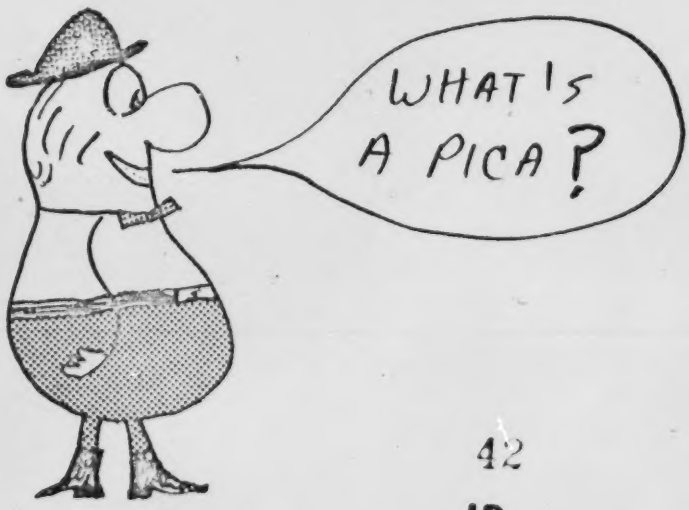
Turn to page 2, item 1

---

2. You have selected the incorrect answer: re-read page 3, item 1.

---

3. Sorry, you have chosen the wrong answer. Re-read page 4, item 2.



Scramble Book Page 2

1. There are 72 points in one inch.

   If the statement is true, turn to page 3, item 1.

   If the statement is false, turn to page 4, item 1.

---

2. Serif type refers to Gothic type.

   If the statement is true, turn to page 1, item 2.

   If the statement is false, turn to page 4, item 2.

---

3. Right, a business letterhead should be neat, dignified, and set mainly in one series of type. Before copy is ready for reproduction, it must be read carefully for errors. The errors should be marked with standard symbols which are called proof marks. After these corrections are made, the revised proof is checked again. This constant proofreading of copy prevents numerous errors from being reproduced in final printed form.

   Turn to page 3, item 3

---

4. Sorry, a corrected proof is called a revised proof. Please re-read page 2, item 3.

Scramble Book Page 3

1. You are correct: there are seventy-two points in one inch. All printing type is calibrated in points with the exception of wood type which is measured in the pica-line. The first movable type that was actually used in printing was invented by Johann Gutenberg during the fifteenth century. Since then, many kinds and styles of type were developed. The major kinds of type are Gothic, Roman, and Script. These kinds of typefaces can easily be distinguished. Roman type has serifs (strokes at the end of the main strokes of the letter). Gothic type does not have serifs. Script type resembles handwriting.

Turn to page 2, item 2

---

2. A business letterhead should be neat, dignified, and composed mainly of one series of type.

If the statement is true, turn to page 2, item 3.

If the statement is false, turn to page 1, item 3.

---

3. A corrected proof is called the first proof.

If the statement is true, turn to page 2, item 4.

If the statement is false, turn to page 4, item 3.

Scramble Book Page 4

1. You have selected an incorrect answer. It is very important that you understand the point system: re-read page 1, item 1.

---

2. You are correct: serif type refers to Roman, not Gothic type. Probably, the most outstanding printed item of a business is its stationery letterhead. In a special sense, the letterhead expresses the character of the business, and much depends upon the impression it makes. As a rule, the letterhead should be neat, dignified, and composed mainly of one series of type. The style of type should be geared to the business. Bold type would be used for certain businesses, and script for others.

Turn to page 3, item 2

---

3. You have selected the correct answer. The revised proof is the corrected proof used to make sure that all corrections and author's alternations have been made.

THE END

THE BUSINESS LETTERHEAD

The business letterhead transmits an important message from a firm to the persons with whom the company corresponds. If the letterhead makes a good appearance, it will give the reader a favorable image of the business. Due to this fact, a considerable amount of thought should be given to the design of the letterhead and the selection of type.

1. Paper Considerations

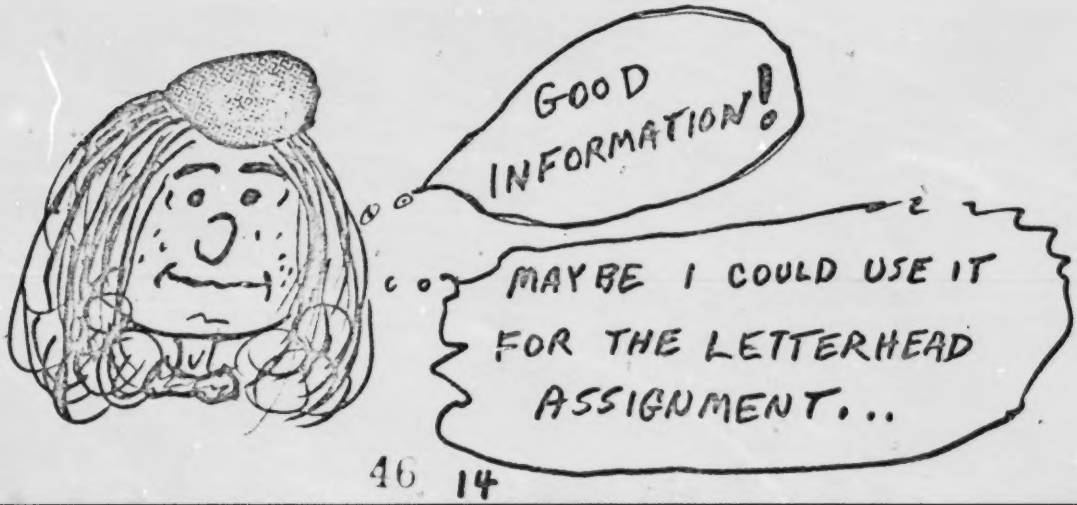
The type of paper upon which business letterheads are printed is called bond. Bond paper is made with a very hard finish which makes an excellent surface for typing and writing. The common sizes for business letterheads are 8½" x 11", 7¼" x 10½", 8½" x 7¼", and 8½" x 5½". The most commonly used size is 8½" x 11".

2. Type Selection

The type used for business letterheads can vary in size from 6 point to 30 point. Generally, type sizes over 30 point are very seldom used. If possible, the letterhead should be composed of no more than one family of type. The type should be positioned in a group. The shape of the group should be given a great deal of consideration. Some of the shapes the type groups should be arranged in are squared, inverted pyramid, long line group, and short line group. The group of type should be centered near the top of the paper.

3. Arrangement of Letterhead

In arranging the group of type, the name of the business should be at the top, the line of business (if not indicated in an illustration) next, and then the address. The name of the business is usually set in the largest type size. If branch offices, telephone number, names of officers, and other subordinate material is to be included, it should be placed in smaller type balanced under the center display. The letterhead design may be improved by adding a trademark or an ornament applying the principles of modern typography.



WONG'S CHINESE RESTAURA

1044 Broadway, Chula Vista, California 92011 (714)426-4

Vaccaro's Italian Restaurant

1044 Broadway, Chula Vista, California 92011 (714)426-4474

RIEKO'S JAPANESE RESTAURANT

1044 Broadway, Chula Vista, California 92011 (714)426-4474

PROCEDURE SHEET

DESIGNING A LETTERHEAD

Materials Needed

Several sheets of white bond paper 8½" x 11" -sub. 20
Pencil - Pen
Ruler
Eraser
Light-blue pencil
Transfer type

Introduction

Probably, the most outstanding printed item of a business is its stationery letterhead. In a special sense, the letterhead expresses the character of the business, and much depends upon the impression it makes. As a rule, the letterhead should be neat, dignified, and orderly. It should be set in one series of type, and the fewest possible sizes. The style of type should be geared to the business. Bold type would be used for certain businesses, and script for others. Color also plays an important part in producing an attractive letterhead. The style, decorations, and extent of color to be used will be dependent upon the nature of the business.

Instructions

1. Make two different designs of a letterhead using the same copy for both designs.

2. Include the following essential points:

   a. Name of individual or company
   b. Full address, street and number, P.O. box number, city, state and zip code
   c. Line of business (if not indicated in company title or in an illustration)
   d. Name of department or branch office

3. Other points which may be included:

   a. Names of company officers
   b. Telephone number
   c. Slogan or trademark

4. Indicate the size and style of type to be used. Make sure the type corresponds with the business. Doctors and lawyers like a very conventional Gothic type for stationery.

5. Indicate the various decorations (if used):
   a. Rules
   b. Ornaments
   c. Drawings
   d. Halftones

6. Indicate the colors that the various items are to be printed in.

7. Turn in thumbnail sketches (two for each design), roughs, and finished comprehensives.

Students Name _____
(Last) (First)

DESIGNING A LETTERHEAD
(Project Evaluation Sheet)

Include this form when submitting project for evaluation	Check (✓) incicates unsatisfactory

THUMBNAIL AND ROUGH

Sizing of elements	_____
Elements balanced correctly	_____
Guidelines included to required dimensions	_____
Selection of harmonious type face groupings	_____

COMPREHENSIVE

Elements properly adhered	_____
Alignment of elements	_____
Cleanliness and touch-up	_____
Protective covering attached	_____
Project identification, 1/8" lettering	_____
Proofreading	_____

Each unit is valued up to 10 points _____

TOTAL _____

DESIGN IN-PROCESS EVALUATION

Directions: While reviewing information sheets and procedure sheets, write in the answers to the following questions. Review this sheet in advance for clues in the information sheets.

1. What is a thumbnail sketch? _____

2. What is a rough? _____

3. What is a comprehensive? _____

4. What is a formal layout? _____

5. What is rhythm? _____

6. What is negative space? _____

7. What is type measured in? _____

8. What is a serif? _____

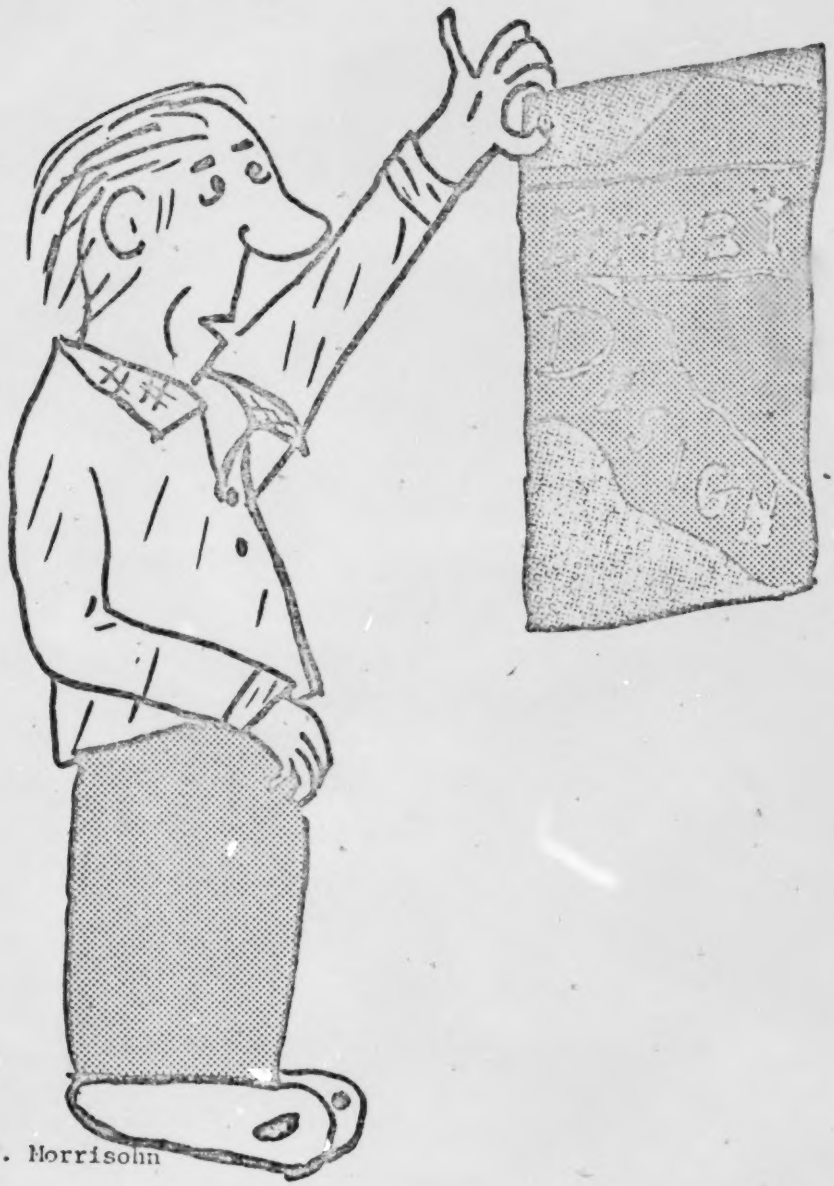
9. Why is it important for businesses to have letterheads designed? _____

10. What is the type and size of paper mainly used for business letterheads?

SUMMATION

Design is the creative portion of the graphics area. It is where printing ideas are set down in layouts and planning takes place to insure that the printed product is functional and has a certain degree of individual style.

After mastering this basic unit, you will be ready to go on to more complex designs.



John P. Morrisohn

NAME _____

DESIGN POST TEST

Directions: Select the best answer and insert the letter in the space provided on the answer sheet.

1. The final layout ready for reproduction is called the ___?___.

   A. thumbnail sketch
   B. rough
   C. comprehensive
   D. printed copy

2. A small quick drawing is a ___?___.

   A. thumbnail sketch
   B. rough
   C. comprehensive
   D. mechanical

3. Which type of layout illustrates the traditional motif?

   A. asymetrical
   B. formal
   C. informal
   D. off-center

4. What is the non-printed area called?

   A. positive space
   B. clear space
   C. white space
   D. black space

5. Eye movement is mainly associated with ___?___.

   A. contrast
   B. layout
   C. rhythm
   D. size

6. When all elements of graphic design have been placed in a sense of equilibrium, the layout has been ___?___.

   A. proportioned
   B. harmonized
   C. balanced
   D. reduced

7. Which of the following instruments should be used to mark guidelines on comprehensive layouts?

   A. ball point pen
   B. embossing pen
   C. light-blue pencil
   D. dark-blue pencil

8. What design principle indicates the pleasing relationship between illustrations, type, rules and various compositional sizes?

   A. harmony
   B. contrast
   C. rhythm
   D. balance

9. The book page margin which is the largest is ___?___.

   A. top
   B. right
   C. bottom
   D. left

10. Type sizes are calibrated in ___?___.

    A. points
    B. picas
    C. nonpareils
    D. inches

11. Serif type generally refers to what major kind of type?

    A. Gothic
    B. Roman
    C. Script or Cursive
    D. Sans Serif

12. The most common size for business stationery is ___?___.

    A. 8" x 10"
    B. 11" x 14"
    C. 8½" x 11"
    D. 9" x 12"

13. If you were designing stationery for a beauty shop, which of the following type styles and designs would you use?

    A. Bodoni bold
    B. News Gothic bold
    C. Stymie bold
    D. Typo Script

14. What kind of type would you use for a doctor's letterhead?

A. Bank Gothic
B. Wedding Text
C. Murray Hill
D. Lydian Bold

15. What item should be set in the largest size of type in the layout of a business letterhead?

A. address
B. department
C. representative's name
D. company's name

14. What kind of type would you use for a doctor's letterhead?

A. Bank Gothic
B. Wedding Text
C. Murray Hill
D. Lydian Bold

15. What item should be set in the largest size of type in the layout of a business letterhead?

A. address
B. department
C. representative's name
D. company's name

APPENDIX E

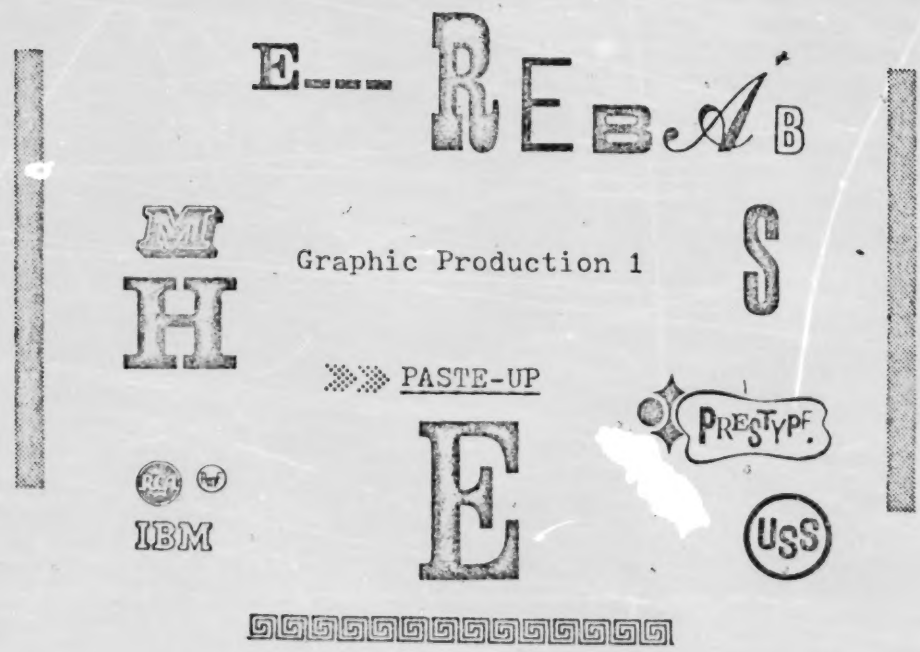
FAULT-UT MODULE

Individualized

Instructional Modules

by

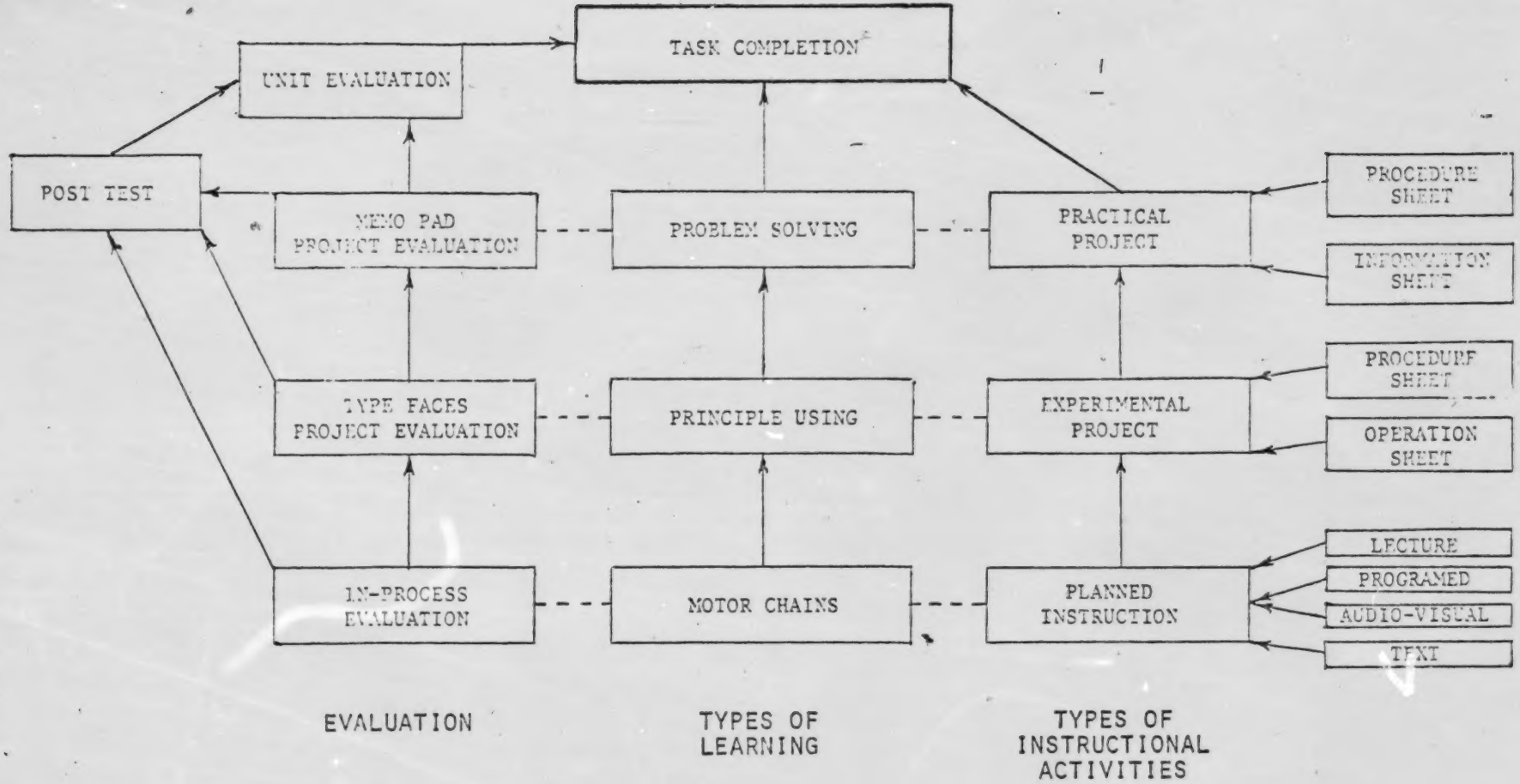
John P. Morrisohn



Graphic Communications Department

Santa Barbara City College

PASTE-UP MODULE



John P. Morrisohn

PASTE-UP

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	Procedure Sheet: Memo Pad Paste-Up	G-6:IS-3B
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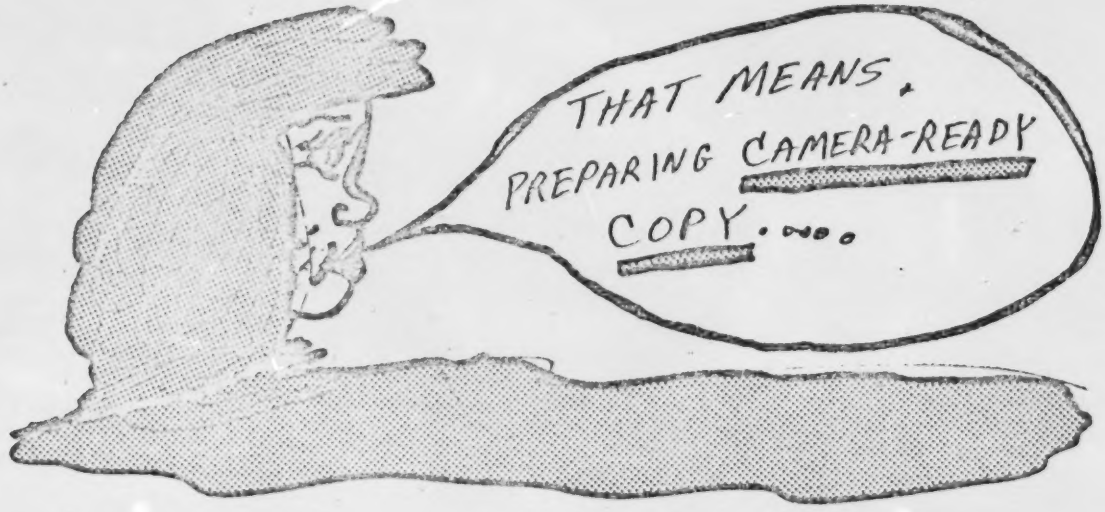
	Project Evaluation	G-6:E-2B

Post Test

Summation

RATIONALE

The paste-up can be viewed as a working drawing with full specifications which present a picture of the finished product. It contains a combination of type composed by various methods, drawings, hand lettering, illustrations, rules, tint screens, and photographically produced materials according to the layout received from the designer. The paste-up artist combines all elements of copy line drawings, rules, tint screens, text, and photographs into a unit which represents the completed project. This process requires accuracy and neatness to insure that all elements are reproduced precisely. In the early stages of paste-up, poor techniques can lead to low quality printing products.



PERFORMANCE OBJECTIVES

Given a basic layout design or dummy, paste-up materials and equipment, you will produce a simple paste-up project with 90 percent accuracy according to the project evaluation, G-6:E-2A.

You will also demonstrate your understanding of the basic terms and operations used in paste-up by selecting the proper terminology or materials which are described, by classifying proper typefaces, by identifying the proper tools, by selecting the proper applications utilized in paste-up with a 90 percent accuracy based upon the Post Evaluation Test, G-6:E-1.

LEARNING ACTIVITY A

Simple Paste-up of Typefaces

PERFORMANCE OBJECTIVE:

Given the prerequisite instruction, materials and experiment sheet, you will identify certain typefaces, place them in order of legibility and neatly paste them onto an 8½" x 11" sheet of paper according to the procedure sheet instruction, G-6:IS-1A.

The following must be completed:

1. Read Broekhuizen, R. J., Graphic Communications, McKnight Career Publications, 1973, pp 36-40.
   or
   Witness instructor's presentation of overhead transparencies on typefaces.

2. Review information sheet, "Paste-up Using Rubber Cement or Wax Coating," G-6:IS-1A.

3. Review procedure sheet, G-6:IS-2A.

4. Complete the in-process evaluation G-6:E-1A.

PASTE-UP USING RUBBER CEMENT OR WAX COATING

Introduction

For many years rubber cement was used for layouts and it is still used by advertising artists and others where the finished layout must be shown to a client for approval before going into production. Recently, however, there has been the development of a wax coating, such as is put on the back of cellophane letters, that can be applied in an office. This has all the neatness of rubber cement and is even easier to apply.

Instructions

1. Apply a thin coating of rubber cement to the back of the copy and on the surface of the layout where the copy is to be put. If using wax, coat just the back of the copy.

2. Trim the pieces of copy leaving about 1/4 inch margin all around, unless the piece will be fitting close to another. Make the cuts fairly parallel to the copy lines or there will be an optical temptation to consider the edge of the paper as well as the printed line.

3. Using the pencil very lightly, rule off the area that the layout is to occupy on a sheet of paper. Find the horizontal center of the area and rule in a vertical center guide line. Find and add any guide lines that are indicated by the rough layout for the placement of elements. Put in the trim and fold marks and register marks if they are required.

4. Startin[illegible] the top of the layout, put the first element into approximate positio[illegible]nd straighten it by eye, using the X-acto knife to move it. Bring the T-quare up and place it on the copy without any pressure except the weight of the T-square. Line up the copy with the T-square and triangle and then rub it around the edges, in its margins, with the handle of the X-acto knife. This will hold it in place, but will not make it so tight that it cannot be lifted and repositioned later.

5. Continue down the layout putting the various elements in. If the element is to be centered, measure it with the ruler and find the center. Mark this lightly in the top margin or with a blue pencil. Lay the element in place using the center guide line put on the layout at the start of the work.

6. After three or four pieces of copy are attached, set the board in a vertical position and stand back several feet to check if things look straight and centered. This will show up lines on which a miscalculation was made and will indicate elements that are too far apart or close together.

7. When the paste-up is completed and has been visually checked, lay a sheet of clean paper over it and rub the paper with the palm of your hand to apply pressure over all the copy. If rubber cement was used take a ball of it and pick up any excess cement. Trim any margins that overlap and touch up any spots with opaque white. Place in a folder for protection until photographed.

PROCEDURE SHEET

IDENTIFYING TYPEFACES

Objective

To have the student learn how to differentiate the basic kinds and styles of typefaces.

Materials Needed

Reproduced copy of various typefaces
Wax-backed lettering or repro proof
One sheet of 8½" x 11" paper - sub. 20
T-square, ruler and drawing board
Scissors and X-acto knife
Waxer or rubber cement
Light-blue pencil

Reference

Broekhuizen, R. J., Graphic Communications, page 40.

Procedure

1. Outline an image area of 7½" x 10" on the sheet of 8½" x 11" paper.
2. Using the waxed-backed lettering, set the title line, "Typefaces", inside the image area and center it toward the top.
3. Cut the various typefaces into blocks from the reproduction copy.
4. Identify the various typefaces by referring to the textbook.
5. Print or type the name of the typeface on or above the appropriate block.
6. Adhere the blocks of typefaces to the image area, placing them in order of legibility (readability) and numbering them 1-7.

CLASSIFICATIONS OF TYPEFACES

Square serif types can easily be identified by the square serif. The serifs have the same weight or thickness as the letter strokes. The letter strokes of square serif types have little or no variation in thickness. Square serif types are durable and are used mainly for display composition, headlines, and short pieces of text material.

Old Style typefaces are generally used when legibility and readability are important factors of design, which is the reason they are often used for text composition. Old Style typefaces have only slight variations in the thick and thin strokes of the letter. Rounded serifs and fillets are also common characteristics of this classification.

Text typefaces are sometimes referred to as Old English. The letters resemble those used by the scribes and are patterned after the earliest types used by Gutenberg. Text types are difficult to read because of the complex design of the letter strokes. These types are used primarily for announcements of special occasions and for Christmas greeting cards. Text types should not be composed in forms of all uppercase (capital) letters.

Modern typefaces have considerable contrast between the thick and thin strokes of the letter and are identified by fine serifs with no fillets. The modern types are used in advertising, book composition, and commercial printing.

Cursive types resemble handwriting and are often called script types. Many cursive types have uniform line weight while others have both thick and thin letter strokes. Cursive types are used for special effects in advertising and for announcements and invitations. Because they are sometimes difficult to read, cursive type forms should not be composed in all capital letters.

"Sans" is a French word which means without. Sans serif type, therefore, is type that does not have serifs. These typefaces have little or no variation in the thickness of the letter strokes. They are often used for display advertising, headlines and captions in books and magazines.

Occasional types are also called decorative or novelty types. These are the attention-getters used in advertising. Each typeface in this classification has individual and distinct characteristics for expressing a particular mood.

SIMPLE PASTE-UP OF TYPEFACES

(In-process Evaluation)

1. When using the waxer, which side of the copy do you coat? _____

2. When trimming pieces of copy, how much margin should be left around the printed area? _____

3. What tool is used to align copy? _____

4. What type of pencil is used to mark guide lines for placement of elements? _____

5. What are the seven classifications of typefaces? _____

6. Which of the seven classifications of typefaces is most legible? _____

7. If rubber cement was used, how would you remove the excess cement from the paste-Up? _____

Student's Name _____
(Last) (First)

SIMPLE PASTE-UP OF TYPEFACES
(Project Evaluation Sheet)

Include this form when submitting project for evaluation	Check (✓) indicates unsatisfactory

PRE-PASTE-UP PLANNING

Component planning and layout . . . . . _____
Trimming of components . . . . . _____
Guidelines . . . . . _____

PASTE-UP PREPARATION

Components cut to within 1/8 inch of image . . . . . _____
Elements properly adhered . . . . . _____
Alignment of components . . . . . _____
Cleanup and detail touch-up . . . . . _____
Protective covering attached . . . . . _____
Project identification, 1/8 inch lettering . . . . . _____
Proofreading . . . . . _____

Each unit is valued up to 10 points

TOTAL _____

LEARNING ACTIVITY B

Paste-up of Personal Memo Pad

PERFORMANCE OBJECTIVE:

Given the prerequisite instruction, basic design, materials and equipment, you will produce a paste-up which is aligned, properly adhered, clean, proofread and camera-ready.

The following must be completed:

1. Read Broekhuizen, R. J., Graphic Communications, McKnight Career Publications, 1973, pp 86-89 and 113-129.
   or
   View slide/tape presentation, "Your Blueprint to Printing."
   or
   Instructor's presentation on paste-up.

2. Review information sheet G-6:IS-2B.

3. Review the scramble unit on paste-up, G-6:IS-1B.

4. Follow procedure sheet on Memo Pad Paste-up, G-6:IS-3B.

5. Complete in-process evaluation G-6:E-1B.

Scramble Book Page 1

SCRAMBLE BOOK

PASTE-UP

1. Job opportunities in the preparation of material for the Graphic Arts camera increase daily. Not only are more and more newspapers--daily and weekly--"going offset", but many letterpress publications find it economical to paste-up display and advertising pages using cold type methods. Design flexibility is a key feature of paste-up. This flexibility is particularly suitable to supermarket and drugstore advertisements. Business publications, technical reports, magazines and many others use camera copy preparations techniques.

Turn to page 2, item 1

---

2. You have selected the incorrect answer. Re-read page 3, item 1.

---

3. Sorry, you have chosen the wrong answer. Re-read page 4, item 2.

Scramble Book Page 2

1. Design flexibility is a key feature of paste-ups.

   If the statement is true, turn to page 3, item 1.

   If the statement is false, turn to page 4, item 1

---

2. Text and art work items have little to do with paste-ups.

   If the statement is true, turn to page 1, item 2.

   If the statement is false, turn to page 4, item 2.

---

3. Right. All paste-ups are made for the sole purpose of being photographed. After the final layout has been approved, paste-up work begins. All elements of copy, simple line drawings, photographs and text, are combined by the artist into a single unit. Instructions on color of ink, type of paper, and other necessary details are written. The paste-up and specifications are then sent to the Lithographer.

   Turn to page 3, item 3.

---

4. Sorry, please re-read page 2, item 3.

Scramble Book Page 3

1. You are correct. The paste-up methods are flexible and rather simple. Paste-ups are used in different types of printing. They are particularly important in the lithographic process which requires a camera-ready copy. The functions of the paste-up is to collect all various items (text and art work) that make up the finished product.

Turn to page 2, item 2.

---

2. Paste-ups are created for a single purpose.

If the statement is true, turn to page 2, item 3.

If the statement is false, turn to page 1, item 3.

---

3. The paste-up artist combines all elements into a double unit.

If the statement is true, turn to page 2, item 4.

If the statement is false, turn to page 4, item 3.

Scramble Book Page 4

1. You have selected an incorrect answer. Please re-read page 1, item 1.

---

2. You are correct. A paste-up is the finished product of various items such as text and art work. All paste-ups are created for a single purpose--to be photographed. There are some rules and procedures which will improve the end product. In some instances, low printing quality may be traced directly to the early stages of paste-up. Poor techniques, poor original copy or lack of planning all lead to low quality printing.

Turn to page 3, item 2.

---

3. You have selected the correct answer. All elements of copy are combined by the artist into a single unit.

THE END

LAYOUT AND GUIDELINES FOR PASTE-UP

The paste-up artist should have an understanding of basic techniques which will produce the desired results with the greatest ease and least chance of error.

The first step in any paste-up is to draw accurate and properly laid out guidelines with light-blue pencil. These light-blue lines will drop out when photographed. The major guidelines used in paste-up work are discussed below.

Printed Page Size. Guidelines should be drawn on the paste-up which accurately outline the size of the printed page. Outlining helps everyone involved in evaluating the spatial relationships of the job. They also guide the pressman in positioning the image properly on the sheet. These lines must show the relation between page size and image size exactly. Page size should not be confused with sheet size. The larger offset presses, of course, print several pages on each sheet that is run through the press.

Center Lines. These lines are drawn in light-blue pencil horizontally and vertically through the center of the image area. The purpose of the lines are twofold; to aid in centering paste-up composition within the image area and for positioning of the copy on the camera copyboard.

Image Area Lines. This is a set of guidelines, usually drawn within the page size area, that indicates the maximum size of the image. They are drawn outside the paper area if the image is to extend to the edge of the trimmed paper. This is called a "bleed." Image lines help to align material along margins by indicating margins clearly. They also help the pressman find a satisfactory space for the "grippers" that pull the paper through the press.

Trim Size. This is the area marked to show the final size of the job after it is trimmed. Thin black ink lines (1/4 inch long) at right angles in the corners of the paste-up are used, in addition to the blue lines, to indicate the finished trim size.

PROCEDURE SHEET

MEMO PAD PASTE-UP

Materials Needed

Paper - 8½" x 11" white index and onionskin
T-square
Triangle
Rubber cement or wax applicator
X-acto knife and scissors
Light-blue pencil
Spot art (clip art)
Transfer type or repro proof

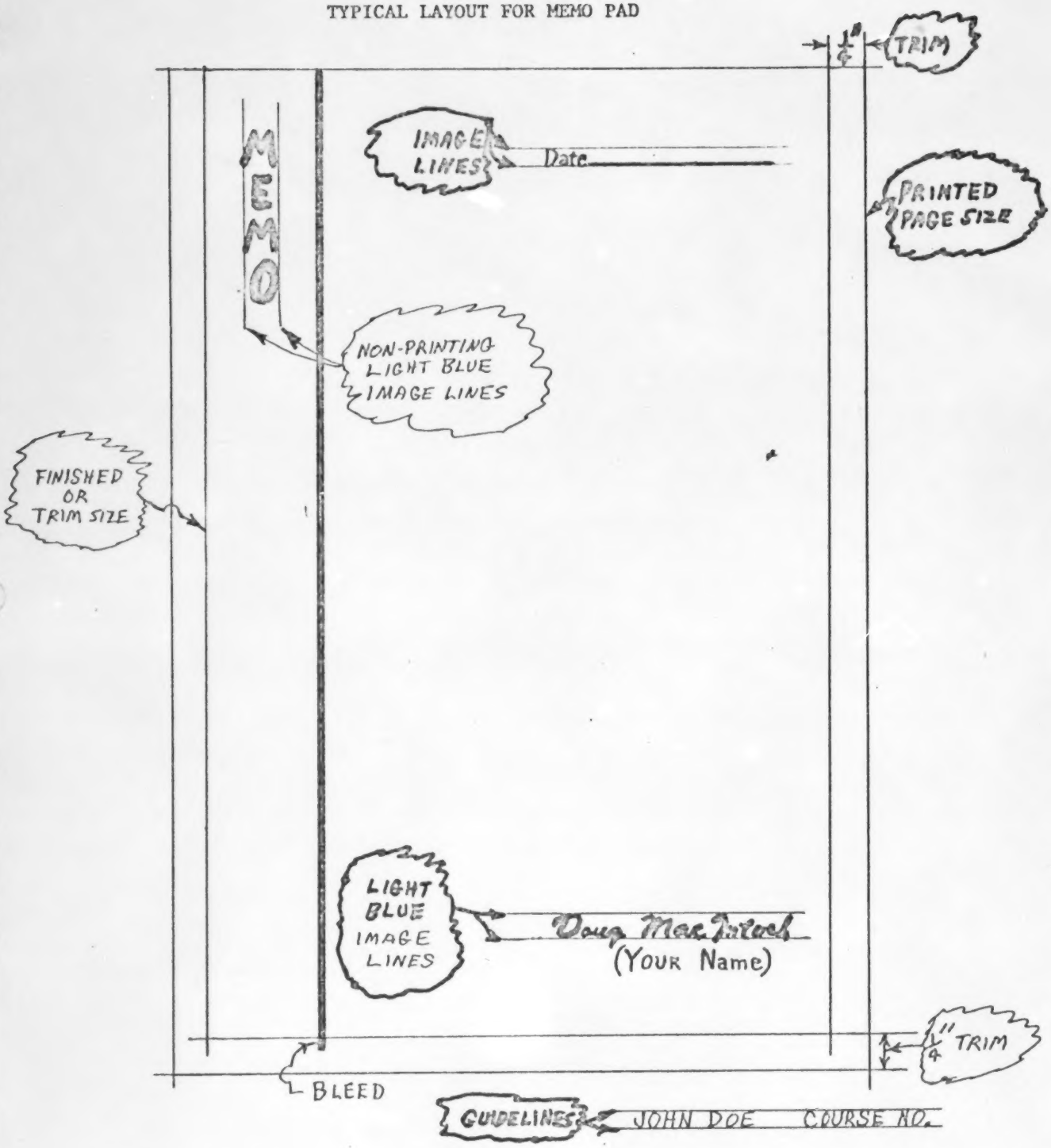
Introduction

The project will entail the layout of a memo pad design, selection of clip art, drawing guidelines, use of transfer type or a repro proof to prepare a camera-ready paste-up.

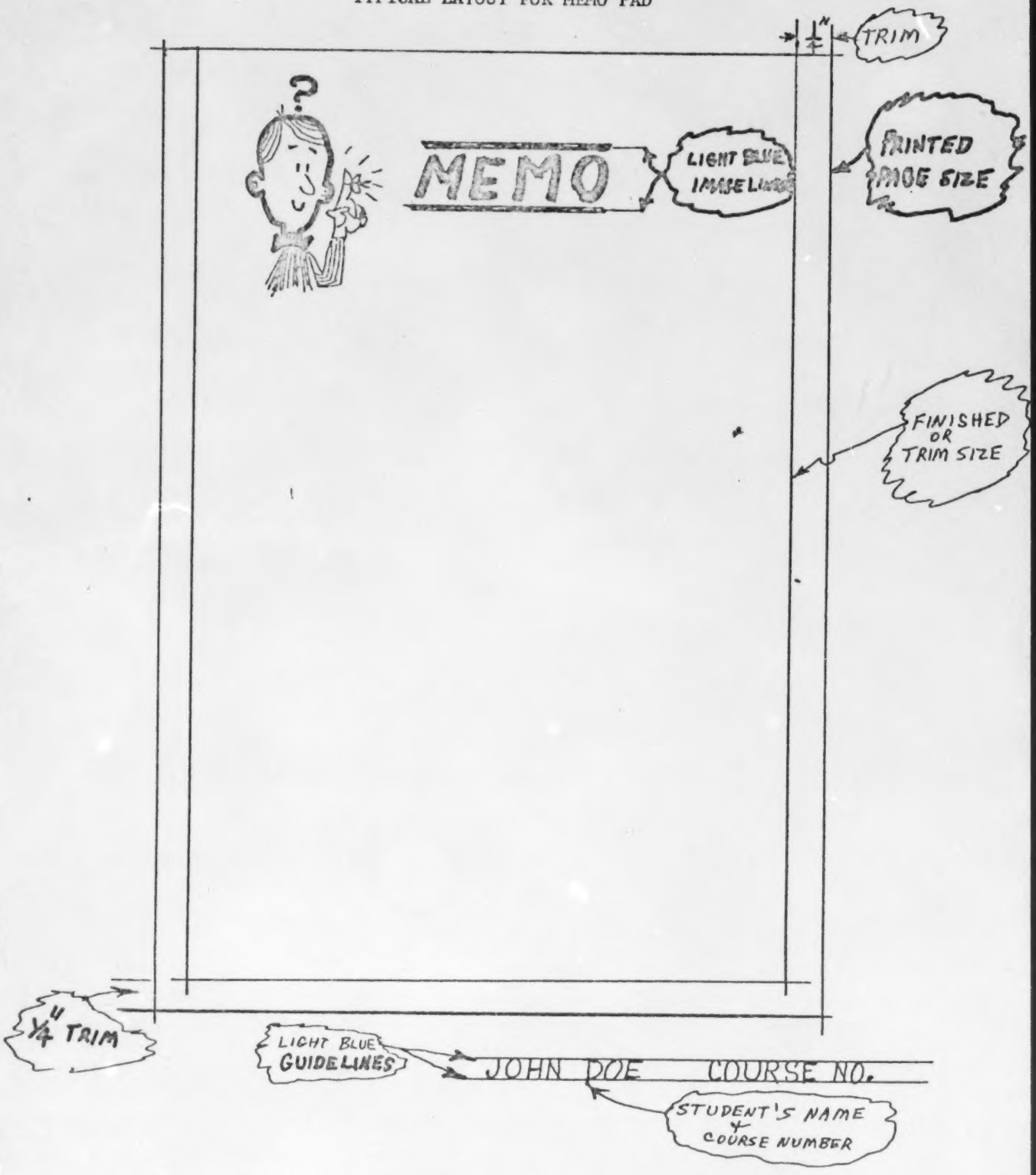
Procedure

1. Align 8½" x 11" paste-up sheet with T-square.
2. Mark sheet size 5½" x 8½" on the center of the paste-up sheet.
3. Mark the finished size (trim) with light-blue pencil.
4. Trim copy elements (clip art, type, repro proofs, etc.) leaving about ¼ inch margin all around.
5. Mark paste-up sheet with light-blue pencil to indicate element locations (allow ¼ inch for gripper edge).
6. Adhere elements to paste-up with either rubber cement or waxer.
7. Place name and course number at the bottom of the paste-up sheet.
8. Put an onionskin cover over the paste-up to protect it.

TYPICAL LAYOUT FOR MEMO PAD



TYPICAL LAYOUT FOR MEMO PAD



PASTE-UP OF PERSONAL MEMO PAD

(In-Process Evaluation)

1. What is the main purpose of a paste-up? _____

2. List three basic paste-up tools. _____

3. What is the meaning of trim size? _____

4. What are image (element) area lines? _____

5. What is camera-ready artwork called? _____

6. What is the gripper edge? How much space do you allow for it? _____

Student's Name _____
(Last) (First)

MEMO PAD PASTE-UP
(Project Evaluation Sheet)

Include this form when submitting project for evaluation	Check (✓) indicates unsatisfactory

PRE-PASTE-UP PLANNING
- Page margins . . . . . _____
- Elements trimmed correctly . . . . . _____
- Guidelines included to required dimensions . . . . . _____

PASTE-UP PREPARATION
- Balanced Elements . . . . . _____
- Elements properly adhered . . . . . _____
- Alignment of elements . . . . . _____
- Cleanliness and touch-up . . . . . _____
- Protective covering attached . . . . . _____
- Project identification, 1/8 inch lettering . . . . . _____
- Proofreading . . . . . _____

Each unit is valued up to 10 points

TOTAL _____

SUMMATION

Paste-up is an essential part of the graphic arts process. When you have successfully completed this module, you will have the knowledge and skills to prepare basic paste-ups for the process camera.

The memo pad paste-up or other basic paste-ups will be utilized in the next module on the camera.

John P. Morrisohn

PASTE-UP POST TEST

1. Name the typeface which resembles handwriting.

   A. Text
   B. Old Style
   C. Square Serif
   D. Cursive

2. Give the classification of the typeface which is sometimes referred to as Old English.

   A. Text
   B. Old Style
   C. Square Serif
   D. Cursive

3. The pre-prepared images secured in booklets are called:

   A. Transfer type
   B. Cuts
   C. Clip art
   D. Engravings

4. The modern method of fastening images to a paste-up sheet is with:

   A. rubber cement
   B. wax
   C. paste
   D. tape

5. What tool is used in aligning the copy?

   A. X-acto
   B. tape
   C. waxer
   D. T-square

6. After waxing copy, your trim margin would be generally __?__ inch.

   A. 1
   B. 3/4
   C. 1/2
   D. 1/4

7. The main purpose of the paste-up process is to prepare copy for the ___?___.

   A. Offset Press
   B. Process Camera
   C. Platemaker
   D. Letterpress

8. The light-blue lines used as guidelines are called ___?___ area lines.

   A. Image
   B. Trim
   C. Printed page
   D. Name

9. How much space do you allow for the gripper margin?

   A. 5/8 inch
   B. 1 inch
   C. 1/2 inch
   D. 1/4 inch

10. The ___?___ cover is placed over the finished paste-up to protect it.

    A. opaque
    B. onionskin
    C. cardboard
    D. manila

APPENDIX F

Individualized

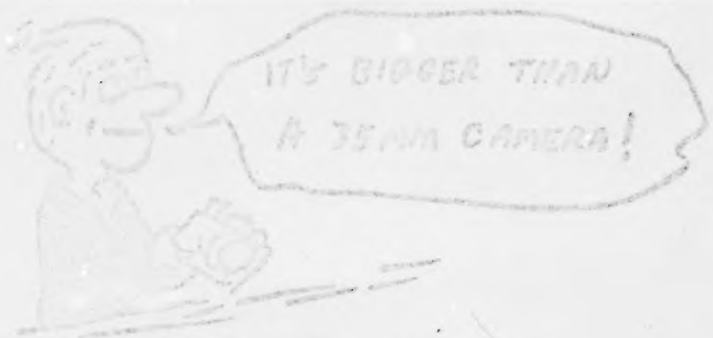
Instructional Modules

by

John P. Morrisohn

Graphic Production 1

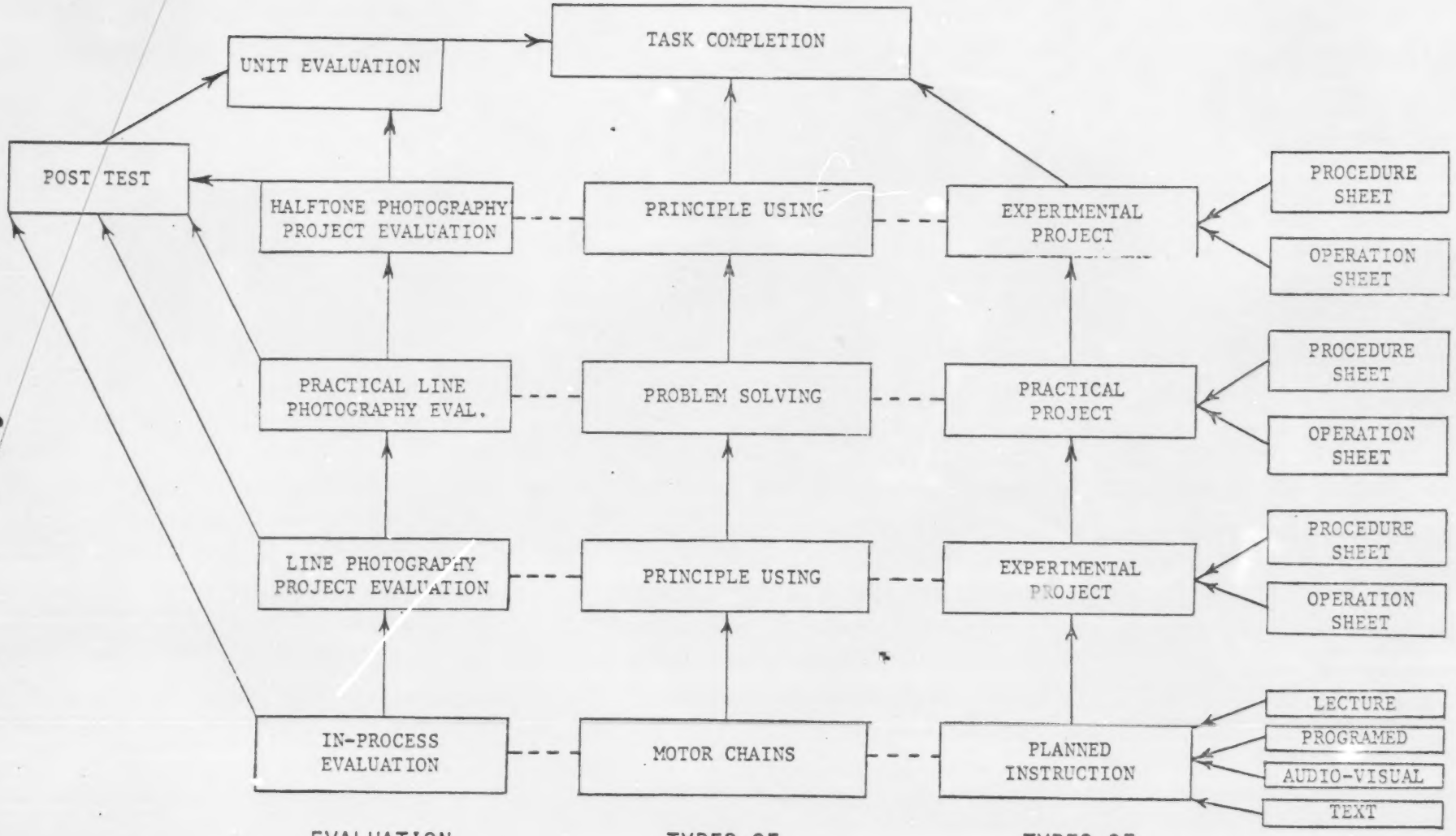
PROCESS CAMERA



Graphic Communications Department

Santa Barbara City College

PROCESS CAMERA MODULE



John P. Morrisohn

PROCESS CAMERA

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Operation Sheet: Basic Film Processing for Line Photography G-8:IS-2A
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Procedure Sheet: Practical Line Photography Project G-8:IS-4A
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Summation

RATIONALE

Process camera work is becoming increasingly fundamental to many phases of the graphic arts industry. This area involves several basic operations of the process camera: making camera adjustments for same size, reductions, enlargements, mixing chemicals, film development and screening of halftone work. The lithographic cameraman is responsible for generating images on film which are classified as line negatives, halftone negatives, line or halftone positives and other processes related to these procedures.

In this module, you will be concerned mainly with basic process camera operations and film development as it pertains to line and halftone photography.

PERFORMANCE OBJECTIVES

Given camera-ready copy, a process camera, darkroom, proper materials and equipment, you will adjust the camera for the correct exposure, generate an image on the film, and process it to produce a proper line or halftone negative of the copy with 90 percent accuracy according to the project evaluation sheets, G-8:E-2A, G-8:E-3A and G-8:E-2B.

You will also demonstrate your understanding of the terms and operations used in the basic process camera unit by identifying the three main parts of a process camera, by labeling the trays in sequential order used in the processing of film, by selecting the proper terminology or materials which are described in the planned instruction, by determining the proper procedure used, and by identifying the proper applications involved in basic line and halftone photography with a 90 percent accuracy based upon the Post Evaluation Test, G-8:E-1.

LEARNING ACTIVITY A1

Experimental Line Photography Project

PERFORMANCE OBJECTIVE:

Given the prerequisite instruction, process camera, darkroom, equipment, chemicals and materials, and instructor's line copy, you will operate the camera, generate an image on film and process the film following the operation and procedure sheets: G-8:IS-1A, G-8:IS-2A and G-8:IS-3A, and to be evaluated during the performance according to the experimental project evaluation sheet G-8:E-2A with 90 percent accuracy.

LEARNING ACTIVITY A2

Practical Line Photography Project

PERFORMANCE OBJECTIVE:

Given the prerequisite instruction, process camera and darkroom, chemicals, equipment, materials and your own memo pad paste-up, you will independently be able to mix chemicals, make camera adjustments for the desired image size, generate an image on film and process the film according to the operation and procedure sheets G-8:IS-1A, G-8:IS-2A, G-8:IS-4A and G-8:IS-5A within 90 percent accuracy according to the project evaluation sheet G-8:E-3A.

The following must be completed:

1. Read Broekhuizen, R. J., Graphic Communications, McKnight Career Publications, 1973, pp 230-236.
   and/or
   View slide/tape presentations, "Introduction to the Process Camera," and "Photographic Film Processing - Tray Method."
   and/or
   Instructor's presentation on line photography.
2. Review operation sheets and information sheets G-8:IS-1A and G-8:IS-2A.
3. Follow procedure sheets G-8:IS-3A and G-8:IS-4A.
4. Complete in-process evaluation G-8:E-1A.

OPERATION SHEET

BASIC PROCESS CAMERA PREPARATION PROCEDURE FOR LINE PHOTOGRAPHY

Materials and Equipment Needed

1. Process camera and darkroom
2. Glass cleaner and soft cloth or towel
3. Sensitivity guide
4. Camera-ready copy
5. Ortho film and film cutter

Procedure

1. Clean copyboard glass with photographic glass cleaner.
2. Center the copy on the copyboard.
3. Position the sensitivity guide (gray scale) on the edge of the copy or in a non-image area of the copy.
4. Close the copyboard glass and carefully position it vertically for exposure.
5. Remove the lens cap and set the lens f/stop (aperture) by turning the diaphragm ring indicator along the f/22 scale to the proper percentage. (For example: actual size would be 100 percent.)
6. Check the position of the lights to make sure that they are within the proper angular range (30° - 60°).
7. Enter the darkroom and turn on white lights.
8. Turn on camera master switch and tape lights.
9. Switch on red safelights and turn off white lights.
10. Check copyboard and lensboard tapes for proper percentage settings.
11. Drop the vacuum back and position ground glass for viewing the copy.
12. Turn focus switch on and check the size and position of your image.
13. Swing the ground glass out of the way and turn the focus switch to the timer position.
14. Cut your Ortho film to the proper size. (Allow at least 1/4 inch border around your image area as indicated on the ground glass.)

15. Position your film on the vacuum back with the emulsion side (light colored side) up.

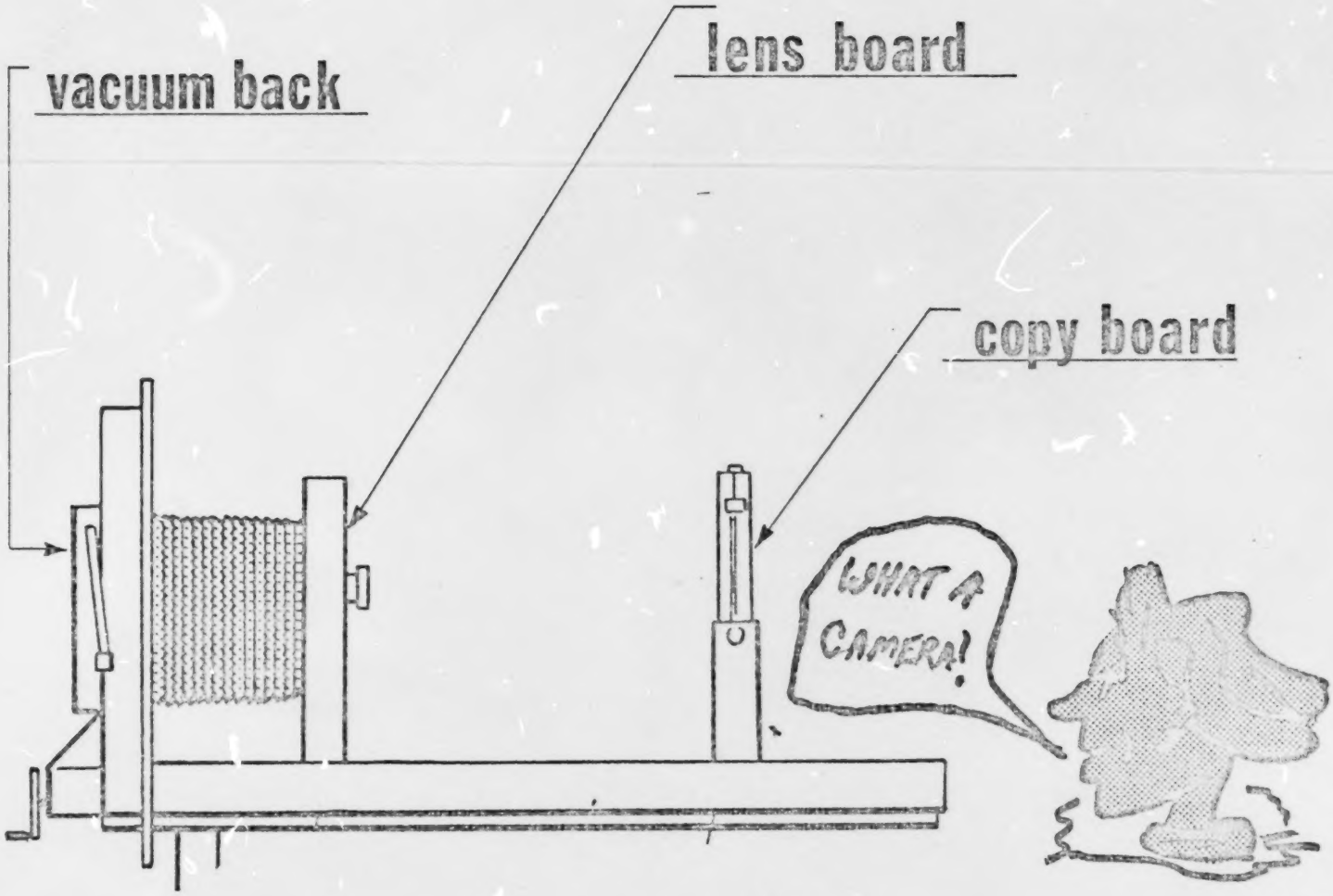
16. Turn your vacuum on and swing the back into a vertical position.

17. Set your timer (20 seconds for normal copy at 100 percent).

18. Press the timer button and expose the film.

19. After the exposure is complete, drop the vacuum back and turn the vacuum off.

20. Remove the film from the vacuum and process the film.



PROCESS CAMERA

OPERATION SHEET

BASIC FILM PROCESSING FOR LINE PHOTOGRAPHY

Materials and Equipment Needed

1. Darkroom and sink
2. Processing trays
3. Litho (stock) Developer A and B
4. Fixer (stock)
5. Short stop (stock) optional
6. Exposed film (with latent image)
7. Thermometer

Preparation for Processing

1. Mix developer using equal amounts of stock litho developer part A and part B.

2. Pour the solution into the developer tray. (Solution level in the tray should be at least 1/2 inch deep.) (Also check the developer temperature - ideal: 68° F - 20° C.)

3. If you are using stop bath, pour stock stop bath solution into the short stop tray. Otherwise, pour water (H_2O) into the tray to at least the 1/2 inch level.

4. Pour the stock fixer into the hypo (fixer) tray to at least the 1/2 inch level.

5. Turn the wash water on in the wash tray.

Film Processing

1. Handling the exposed film (with latent image) by the corner, place the film emulsion side (lighter side) down in the developer.

2. Agitate the developer tray rapidly for about 5 seconds. (Tilt it from side to side.)

3. Pick the film up by the corner and flip it over so that the emulsion side (lighter side) faces up in the developer tray.

4. Agitate the tray using a constant agitation rate (right side to left side and far side to near side).

5. After 1½ minutes, the image will start to appear. When the scale on the 12-step sensitivity guide turns black at step 4, or when the A turns black on the NuArc gray scale, pick the film up by the corner and let the excess developer drain from the film for a second or two.

6. Place the film in the short stop tray (or rinse tray) and agitate for about 5 seconds.

7. Lift the film by the corner from the stop bath (or rinse tray), and place it in the fixer tray.

8. Agitate the fixer tray for approximately 2-4 minutes (double the time it takes the milkiness to disappear).

9. Remove the negative from the fixer tray (letting the excess hypo drain into the tray) and place it in the wash tray for 5-10 minutes.

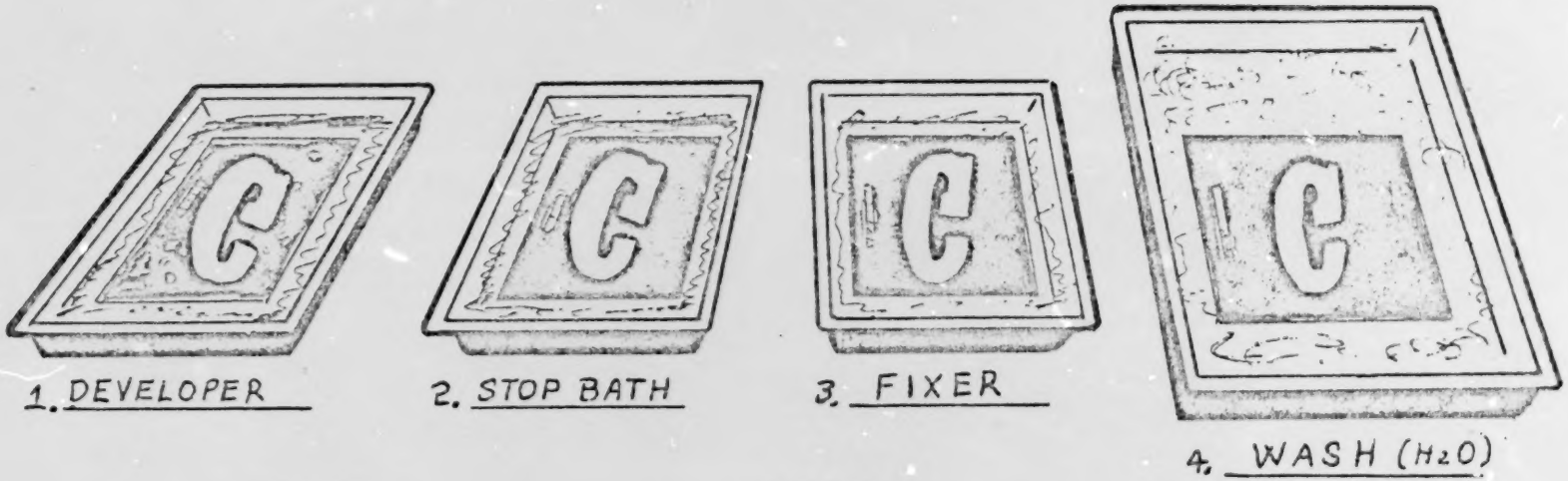
10. After the negative has been washed, place it base side up (right reading) on a smooth surface and squeegee the excess water from the negative.

11. Then, hang the negative up to dry thoroughly.

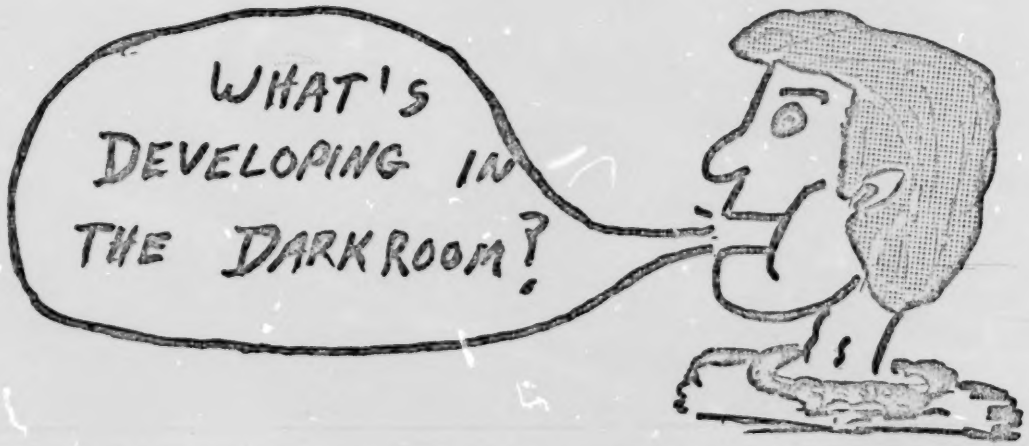
LINE PHOTOGRAPHY

Film Processing

Trays should always be lined up in the same order.



1. DEVELOPER
2. STOP BATH
3. FIXER
4. WASH (H_2O)



PROCEDURE SHEET

EXPERIMENTAL LINE PHOTOGRAPHY PROJECT

Tools and Materials

Glass cleaner and soft cloth or towel
Gray scale
Process camera
Trays
Chemicals: developer, stop bath, fixer and H_2O
Orthochromatic film and film cutter
Thermometer
Darkroom and sink
Instructor's camera-ready copy

Procedure

1. Obtain camera-ready line copy from instructor.
2. Position copy and sensitivity guide (gray scale) on the copy board.
3. Adjust lens aperture setting for 100 percent (actual size) at f/16.
4. Set copyboard and lensboard tapes for 100 percent.
5. Adjust exposure timer to the time setting given to you by the instructor.
6. Expose film.
7. Develop film (with latent image) until step 4 on the sensitivity guide or A on the NuArc gray scale turns black. (Areas exposed to light will turn to black metallic silver.)
8. Place it in the stop bath or rinse for 5 seconds.
9. Fix for twice the time it takes the milkiness to disappear (approximately 2½ minutes). Hypo dissolves the unused silver particles.
10. Wash the film for 5-10 minutes to remove the chemical residue.
11. Squeegee and dry.
12. Turn completed negative in with evaluation sheet.

PROCEDURE SHEET

PRACTICAL LINE PHOTOGRAPHY PROJECT

Tools and Materials

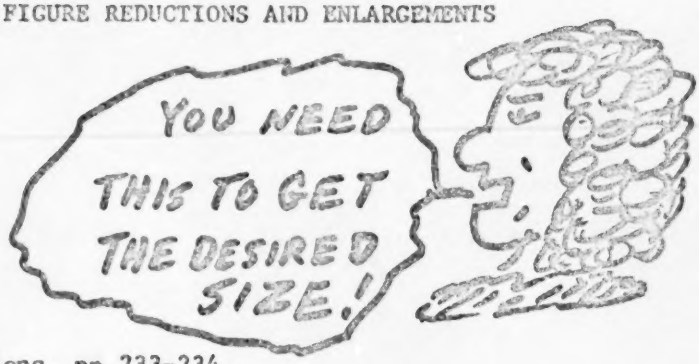
Process camera
Darkroom and sink
Glass cleaner and soft cloth or towel
Gray scale
Student's memo pad paste-up (camera-ready copy)
Trays
Chemicals: developer, stop bath, fixer and H_2O
Thermometer
Orthochromatic film and film cutter

Procedure

1. Clean the copyboard glass.
2. Place your paste-up on the copyboard with the sensitivity guide (gray scale).
3. Adjust camera for desired image size and exposure time.
4. Mix chemicals.
5. Place film on the vacuum back and expose your film.
6. Process your film.
7. Turn negative in with evaluation sheet G-8:E-3A.

OPERATION SHEET

HOW TO FIGURE REDUCTIONS AND ENLARGEMENTS



Materials Needed

Proportional scale
Paper
Pencil

Reference

Graphic Communications, pp 233-234.

Introduction

In lithography, where parts of a job are often reduced and enlarged to fit a set space, it is essential that a person master the method of figuring the percentage of reduction or enlargement to change the existing copy to the desired size.

Procedure

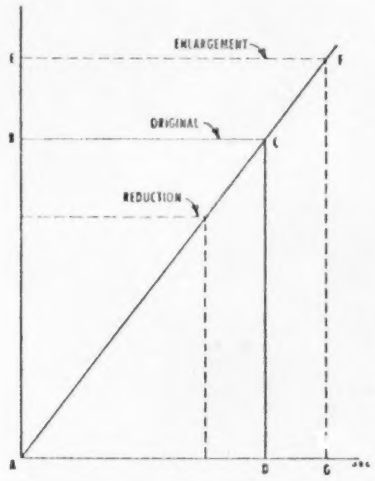
1. This nine word rule will work in all cases of figuring size changes: "Divide the desired dimension by the existing dimension." As an example, if one wants to find the percentage required to change 12" to 9", he would divide the desired dimension (9") by the existing dimension (12") and get an answer of .75. By pointing off two places to the right and adding the percent sign, this becomes 75 percent.

2. Every piece of artwork has two dimensions and each must be figured. They will rarely come out the same unless the artwork has been proportioned for the space. Because the camera will change both dimensions by the same percentage, the smaller of the two must be used.

3. It is usually necessary to know what the final image size will be and this can be found by multiplying the existing dimensions by the percentage of reduction or enlargement, in all cases. Since the percentage was found by dividing the two dimensions, the one which yielded the figure is brought to the new dimension. It will be necessary to calculate only the other dimension. If the other dimension was 18", it would be multiplied by .75, giving a new length of 14½". Therefore, the final image size would be 9" x 14½".

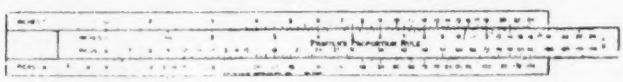
4. When using the percentage calculator, set the copy size on the inner scale opposite the new desired size on the outer scale. Then, read the percentage in the window opening above the arrow.

dotted lines will be the correct, required size (enlarged or reduced depending upon the size of the space in the text of the copy to be reproduced).



Figuring enlargements and reductions by the diagonal-line method.

Proportional scale.



Proportional rule. (Courtesy Engineering Instruments, Inc.)

PROCESS CAMERA - LINE PHOTOGRAPHY
(In-Process Evaluation)

1. What are the three main parts of the process camera? _____

2. What is the f/stop setting for line photography? _____

3. How do you position the lights in relation to the copyboard? _____

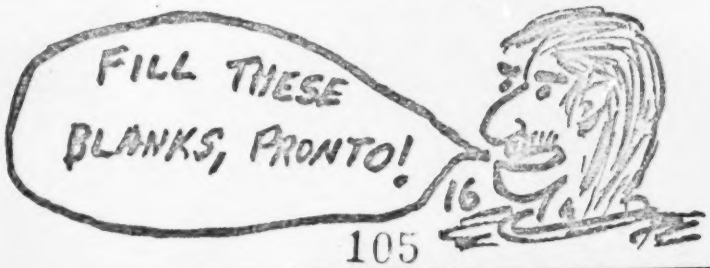
4. What is the reason for the ground glass? _____

5. What is the time exposure for normal copy? _____

6. Which side of the film should be facing the copy? _____

7. What is placed along with the copy to help determine visual development?

8. List the steps in processing film in the proper order.



Student's Name _____ _____
(Last) (First)

EXPERIMENTAL LINE PHOTOGRAPHY PROJECT
(Project Evaluation Sheet)

Evaluation to be completed during experiment	Check (✓) indicates unsatisfactory	Possible
CAMERA OPERATION		
Copyboard Procedure	_____	10
Lens Setting	_____	10
Percentage Tapes	_____	10
Exposure Time Setting	_____	10
Positioning of Film on Vacuum Back	_____	10
PROCESSING FILM		
Handling Film	_____	10
Film Development	_____	10
Stop Bath	_____	10
Fixing	_____	10
Washing and Drying	_____	10
Each unit is valued up to 10 points		
TOTAL	_____	100

Student's Name _____
(Last) (First)

PRACTICAL LINE PHOTOGRAPHY PROJECT
(Project Evaluation Sheet)

Include this form when submitting project for evaluation	Check (✓) indicates unsatisfactory

		Possible
CAMERA OPERATION		
Sensitivity guide (gray scale) properly positioned	_____	10
Positioning of lights	_____	10
Focus	_____	10
Minimum amount of film used	_____	10
PROCESSING FILM		
Film image fully developed to proper step	_____	10
Image completely recorded with at least ¼" border .	_____	10
Negative fixed properly	_____	10
Negative completely washed	_____	10
Negative thoroughly dried	_____	10
Negative free from scratches	_____	10
Each unit is valued up to 10 points		
TOTAL	_____	100

LEARNING ACTIVITY B

Experimental Halftone Photography Project

PERFORMANCE OBJECTIVES:

Given the prerequisite instruction, process camera and darkroom, materials and equipment, main and flash exposure setting, continuous tone copy from the instructor, you will produce a halftone negative following the operation and procedure sheets G-8:IS 3B and G-8:IS-4B, and to be evaluated during the performance according to the experimental project evaluation sheet G-8:E-2B with 90 percent accuracy.

The following must be completed:

1. Read Broekhuizen, R. J., Graphic Communications, McKnight Career Publications, 1973, pp 162, 230 and 236.
   and/or
   View slide/tape presentation "Halftone Photography".
   and/or
   Instructor's presentation on halftone photography.

2. Review the programed unit on basic halftone photography, G-8:IS-1B.

3. Review operation sheet on halftone photography, G-8:IS-3B.

4. Follow procedure sheet on Experimental Halftone Photography Project G-8:IS-4B.

5. Complete in-process evaluation G-8:E-1B.

Scramble Book Page 1

SCRAMBLE BOOK

BASIC HALFTONE PHOTOGRAPHY

1. Continuous tone photos (original camera copy) are reproduced by a process known as halftone photography. The graduation of tone in a photo is changed by printing a broken pattern in which dots, in an equally spaced pattern, vary in size in different areas to give the illusion of lighter and darker tones. Graduation of tones is found in pencil drawing, original photographs, oil paintings, watercolors, lithographs, and crayon art.

Turn to page 2, item 1

---

2. You have selected the incorrect answer. Return to page 3, item 1.

Copy negatives contain three main area of intensities.

---

3. You have chosen the wrong answer. Reread page 4, item 2.

The emulsion sides of both the film and screen should be placed together.

Scramble Book Page 2

1. Graduation of tone is found in original photographs as well as pencil drawings.

   If the statement is true, turn to page 3, item 1.

   If the statement is false, turn to page 4, item 1.

---

2. A copy negative contains four different areas and intensities of dot patterns.

   If the statement is true, turn to page 1, item 2.

   If the statement is false, turn to page 4, item 2.

---

3. Correct. The film and screen are placed in direct contact with emulsion to emulsion.

   Contact screens should be protected against scratches, dirt and liquid stains. They should be handled by the edges and never handled with wet or damp hands. The screen may be dusted with a photo chamois.

---

4. Sorry, please re-read page 2, item 3.

   Contact screens are not liquid resistant.

Scramble Book Page 3

1. You are correct! Original camera copy and pencil drawing both contain graduation of tone, ranging from the lightest parts to the darkest. The lightest areas (highlight) of the copy reflect the greatest amount of light, producing on the negative the largest black dots. The dots are large and overlapping and leave only tiny pinpoints of clear area on the film. The middle-tones (mid-tones) produce a checkerboard effect on the negative, depending upon the shading of the mid-tone areas. The shadow areas (darkest) reproduce transparent areas with tiny pinpoint black dots or, sometimes, no dots at all.

Turn to page 2, item 2.

---

2. When shooting a halftone, the screen should be placed with its emulsion side to the emulsion side of the film.

If the statement is true, turn to page 2, item 3.

If the statement is false, turn to page 1, item 3.

---

3. Contact screens are water resistant, so the copy worker does not have to worry about working with damp hands.

If the statement is true, turn to page 3, item 4.

If the statement is false, turn to page 4, item 3.

Scramble Book Page 4

1. You have selected an incorrect answer. Reread page 1, item 1.

   You must be able to understand graduation of tone. Reread page 1, item 1.

---

2. You are correct! Copy negatives contain three main areas of intensities: highlight, mid-tones and shadow areas.

   Continuous tone copy is broken into halftone patterns by passing the image through a glass halftone screen, by passing the image through a flexible contact screen, or by making the exposure directly on a film which has a screen pattern built into its light sensitivity. The screen should always be placed in direct contact with the film, with emulsion to emulsion.

Turn to page 3, item 2.

---

3. You have selected the correct answer!

   Right! The screen is not liquid resistant and should be handled by the edges with dry hands.

THE END

HALFTONE SCREENING

Principle of Halftone Screening

The basis of halftone screening is that, if the photograph is broken up into thousands of dots of ink and these dots vary in size, the optical illusion of shades of gray will occur. This is because the proportion of ink to unprinted paper in a given area will result in a lighter or darker response to the eye.

The basic screen is made by ruling a number of parallel lines running from 65 to 300 per inch, with the space between being the same width as the lines. Two such pieces of ruled material are laid face to face so they cross at 90 degrees and this results in a screen with thousands of dots per square inch, ranging from 4,225 to 90,000.

Glass Screen

The oldest form of halftone screen is the glass screen. This is made as described above using two pieces of glass. The screen must be supported a few thousands of an inch in front of the film so that the light coming through an opening will shape into a dot. If a black area is being photographed by that particular opening, it will have little exposure and will be quite small. If white is being photographed, it will get a great deal more exposure and will be big and solid. The glass screen must be handled very carefully as it is extremely costly and it must be carefully and solidly hung in a place in the camera.

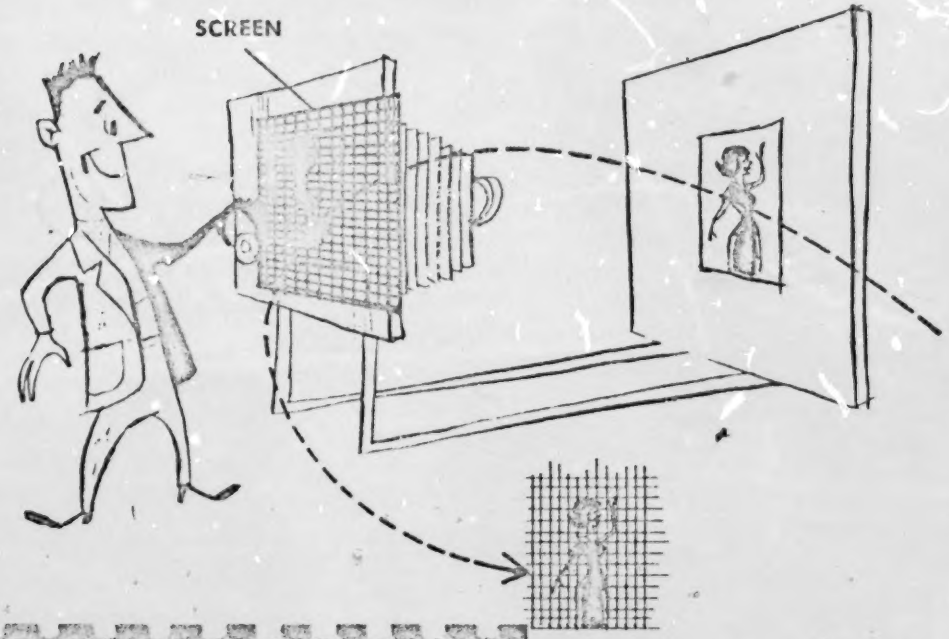
Contact Screen

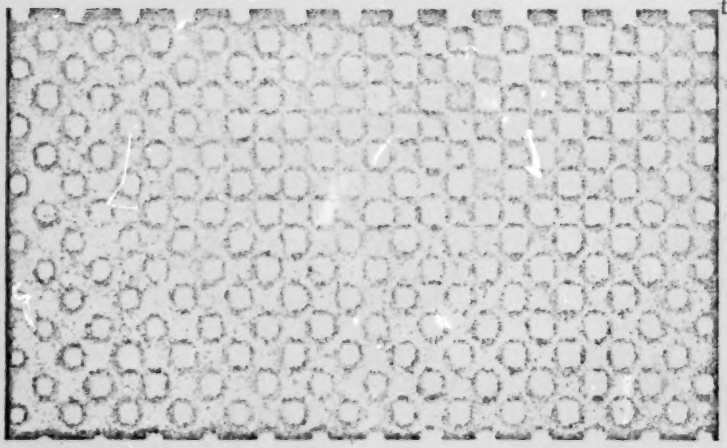
The contact screen is replacing the glass screen in new installations because it is not so fragile nor expensive and requires no screen mechanism to hold it. As the name implies, this screen is put in contact with the sheet of film and must be drawn tight by a vacuum back. This type of screen is actually a piece of film that has been exposed to a glass screen to yield a pre-formed dot that breaks up the light passing through it to the film.

Autoscreen Film

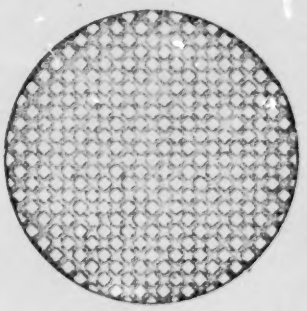
In order to do halftones in a camera that does not have a vacuum back one manufacturer produces a special film that has the screen pattern applied within the emulsion layer. This film is exposed the same as line film, but it develops as a halftone negative.

What Is a Halftone and How Is It Made?





MAGNIFIED KODAK MAGENTA CONTACT SCREEN



MAGNIFIED CROSSLINE SCREEN

Letterpress, lithography, and screen-process printing cannot reproduce tone gradations in a picture by depositing varying amounts of ink. Instead, they do so by different-size dots of ink—small dots for light tones, and large dots which run together for deep tones. Such a pattern is called a "halftone." This is obtained by placing a "half-tone screen" in front of the KODALITH Film when the negative is made in the camera. There are two types of halftone screens: (1) the ruled glass screen, and (2) the contact screen.

HALFTONE PHOTOGRAPHY

The following are the general steps in making a halftone negative.

1. Make density readings of highlight and shadow areas of copy; determine main and flash exposures. In order to determine your exposures refer to the Kodak Exposure Computer and Reflection Density Guide.

2. Place the copy in the copyboard.

3. Set the lens opening, lights, and bellows and copyboard extensions for the magnification desired. As a starting point the following figures have been computed for our two cameras:

Large camera	f/16	sec. main	sec. flash
Small camera	f/16	sec. main	sec. flash

Remember that these figures are only a starting point for making 100%(same size) halftone negatives, and that for: Reductions-Exposures must be decreased!
Enlargements-Exposures must be increased!

4. Place a sheet of unexposed film (such as Kodalith Ortho Type 3) on the vacuum back of the camera, emulsion side of the film toward the operator and, ultimately , toward the lens. (The emulsion side of the film is the lighter side.)

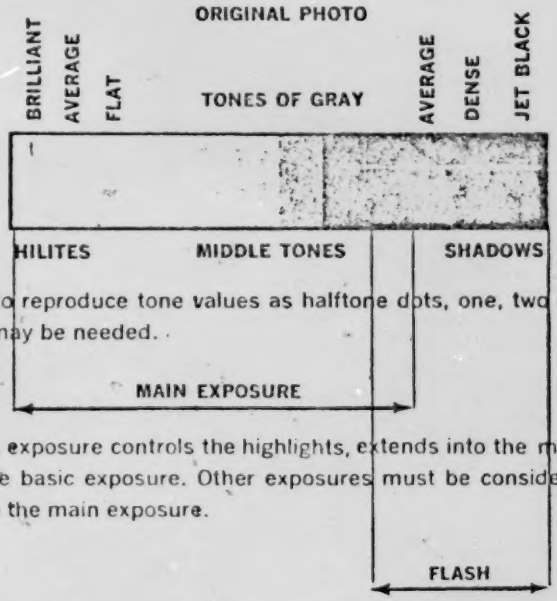
5. Place the Elliptical Dot screen in contact with the film. (For whatever size film is being used, select and use a contact screen which will extend sufficiently --an inch or more--beyond the film on all sides, to insure good vacuum.)

6. Make the Main exposure. (This exposure of the film through the lens is often called the Detail as well as the Main exposure.)

7. Open the camera back and expose the film set-up (screen still in place) to a flashing lamp.

8. Process the film.

A gray scale is just a representation in steps of the tones from white to black that comprise a photographic picture.



In order to reproduce tone values as halftone dots, one, two or three exposures may be needed.

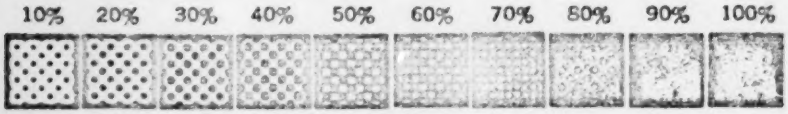
The main exposure controls the highlights, extends into the middle tones, and is the basic exposure. Other exposures must be considered supplemental to the main exposure.

The yellow flash exposure extends the tonal reproduction range into the denser blacks which did not reflect enough light during the main exposure to develop a printable dot.

DOT VALUES—The values of a halftone dot are referred to in terms of percentages comparing black to white areas. A dot value that contains 50% black and 50% white areas is a 50% dot and this formation gives the appearance of a checkerboard.

On a negative, the heavily exposed areas (a 90% dot) are referred to as a hilite dot since they correspond to the whites or hilites of the original copy. The shadows of a negative are indicative of less exposed areas such as the 10% dots.

On a positive, the lighter areas (10%) dots are hilites and the darkest areas (90%) dots are shadows.



— — — — *Enlarged halftone dot scale.*

HALFTONE TROUBLE CORRECTIONS		
TROUBLE	**CAUSE**	**REMEDY**
Weak hilites—hilite dots too large (open)	Insufficient exposure and/or development	Increase exposure or development
Plugged hilites—hilite dots too small (plugged)	Overexposure and/or development	Adjust exposure and development
Shadow dots too large	Flashed too long	Reduce flash time
Shadow dots too small	Insufficient flash	Increase flash
Normal hilite dots—shadow dots too small	Proper main exposure but insufficient flash	This common problem is caused by improper interpretation of shadows. Still development after hilites are fully developed will increase shadow cut size.
Hilite dots too large—shadow dots too large	Insufficient main exposure —too much shadow flash	Increase main exposure and reduce flash exposure
Blotches in hilites	Out of contact screen	Use rubber roller to flatten screen against film
Streaks	Improper agitation	Uniformly agitate
Flat middletones	Underdevelopment	Increase development

PROCEDURE SHEET

EXPERIMENTAL HALFTONE PHOTOGRAPHY PROJECT

Materials and Equipment Needed

Process camera and darkroom (litho)
Orthochromatic film
Sensitivity guide (gray scale)
Chemicals (litho)
Thermometer
Contact screen
Glass cleaner and soft cloth or towel
Flash exposure light

Procedure

1. Obtain continuous tone copy from your instructor along with the main exposure and flash exposure time settings.
2. Clean the copyboard glass with photographic glass cleaner.
3. Place the copy and gray scale on the copyboard positioning the sensitivity guide (gray scale) on the side of the continuous tone copy.
4. Adjust the aperture on the f/16 scale to 100 percent (for actual size).
5. Check the copyboard and lensboard tapes for the proper position.
6. Set the camera timer for the main exposure.
7. Set your flash timer for the recommended exposure.
8. Position the film on the vacuum back.
9. Place the contact screen over the film so that the contact screen emulsion side (dull or curl side) faces the emulsion side of the film (make sure there are no air bubbles).
10. Make your main exposure.
11. Then, open your vacuum back and make your flash exposure.
12. Remove screen and place it in the screen folder.
13. Develop your film until step (1) one is almost black (at least a 90 percent dot).
14. Finish processing the film in a similar manner to the line photography project.

15. After processing, check to see that you have at least a 90 percent dot in step (1) one, 10 percent dot in step (12) twelve, and a 50 percent dot (square) in step (6) six.

16. Turn the negative in with the project evaluation sheet G-8:E-2B.

PROCESS CAMERA - BASIC HALFTONE PHOTOGRAPHY
(In-Process Evaluation)

1. What is a halftone screen composed of? _____

2. What is the purpose of a halftone screen? _____

3. What do shadow areas refer to on the original photograph? _____

4. What do hilite areas refer to on the original photograph? _____

5. What do middle tones refer to on the original photograph? _____

6. What technique is used to extend the dot pattern in the shadow area?

7. What f/stop is used for halftone photography? _____

8. What main exposure is used for normal photographs? _____

9. What flash exposure is used for normal photographs? _____

10. When your film is on the vacuum back, which side of the contact screen faces the film? _____

11. When you are developing film that has been exposed through a screen, how do you determine how long to develop the film? _____

_____

_____

_____

_____

Students Name _____
(Last) (First)

EXPERIMENTAL HALFTONE PHOTOGRAPHY PROJECT
(Project Evaluation Sheet)

Evaluation to be completed during experiment	Check (√) indicates unsatisfactory	Possible
CAMERA OPERATION		
Copyboard procedure	_____	10
Aperture setting	_____	10
Percentage tapes	_____	10
Positioning film and screen	_____	10
Main exposure	_____	10
Flash exposure	_____	10
PROCESSING FILM		
Development (at least 90% dot in step 1)	_____	10
Stop bath, fixing, washing, drying	_____	10
Shadow dot (at least 10% on negative)	_____	10
Midtone dot (square in step 6)	_____	10
Each unit is valued up to 10 points		
TOTAL	_____	100

SUMMATION

The process cameraman plays a critical role in the conversion of camera-ready images into negatives. These negatives are then stripped on masking sheets for the platemaking process. Then, the plates are transferred to the printing press where the images are printed on sheets of paper.

Your projects will follow this same procedure.

John P. Morrisohn